

176

April 23, 2021 Letting

Notice to Bidders, Specifications and Proposal



Illinois Department
of Transportation

Contract No. 93747
SANGAMON County
Section 19-00488-00-BR (Springfield)
Routes FAU 7985A & FAU 7989 (Cook St. & South

Grand Ave)

District 6 Construction Funds

Prepared by

S

Checked by



- 1. TIME AND PLACE OF OPENING BIDS.** Electronic bids are to be submitted to the electronic bidding system (iCX-Integrated Contractors Exchange). All bids must be submitted to the iCX system prior to 12:00 p.m. April 23, 2021 prevailing time at which time the bids will be publicly opened from the iCX SecureVault.
- 2. DESCRIPTION OF WORK.** The proposed improvement is identified and advertised for bids in the Invitation for Bids as:

**Contract No. 93747
SANGAMON County
Section 19-00488-00-BR (Springfield)
Routes FAU 7985A & FAU 7989 (Cook St. & South Grand Ave)
District 6 Construction Funds**

Remove the structures carrying the Norfolk Southern Railroad over Cook Street and South Grand Avenue, Construction of two railroad structures over Cook Street, construction of two railroad structures over South Grand Avenue, track removal, approach roadways, storm sewer, sanitary sewer, pump stations, curb & gutter, sidewalks, lighting, fencing and pavement markings all in the city of Springfield.

- 3. INSTRUCTIONS TO BIDDERS.** (a) This Notice, the invitation for bids, proposal and letter of award shall, together with all other documents in accordance with Article 101.09 of the Standard Specifications for Road and Bridge Construction, become part of the contract. Bidders are cautioned to read and examine carefully all documents, to make all required inspections, and to inquire or seek explanation of the same prior to submission of a bid.

(b) State law, and, if the work is to be paid wholly or in part with Federal-aid funds, Federal law requires the bidder to make various certifications as a part of the proposal and contract. By execution and submission of the proposal, the bidder makes the certification contained therein. A false or fraudulent certification shall, in addition to all other remedies provided by law, be a breach of contract and may result in termination of the contract.
- 4. AWARD CRITERIA AND REJECTION OF BIDS.** This contract will be awarded to the lowest responsive and responsible bidder considering conformity with the terms and conditions established by the Department in the rules, Invitation for Bids and contract documents. The issuance of plans and proposal forms for bidding based upon a prequalification rating shall not be the sole determinant of responsibility. The Department reserves the right to determine responsibility at the time of award, to reject any or all proposals, to readvertise the proposed improvement, and to waive technicalities.

By Order of the
Illinois Department of Transportation

Omer Osman,
Acting Secretary

INDEX
FOR
SUPPLEMENTAL SPECIFICATIONS
AND RECURRING SPECIAL PROVISIONS

Adopted January 1, 2021

This index contains a listing of SUPPLEMENTAL SPECIFICATIONS, frequently used RECURRING SPECIAL PROVISIONS, and LOCAL ROADS AND STREETS RECURRING SPECIAL PROVISIONS.

ERRATA Standard Specifications for Road and Bridge Construction (Adopted 4-1-16) (Revised 1-1-21)

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F.A.U. Route 7985A (Cook Street)
F.A.U. Route 7989 (South Grand Avenue)
Section No. 19-00488-00-BR
City of Springfield
Sangamon County

SPECIAL PROVISIONS
SPRINGFIELD RAIL IMPROVEMENTS PROJECT
USABLE SEGMENT V

F.A.U. ROUTE 7985A (COOK STREET)
F.A.U. ROUTE 7989 (SOUTH GRAND AVENUE)

SECTION NO. 19-00488-00-BR
PROJECT Z0BP(501)
CITY OF SPRINGFIELD, SANGAMON COUNTY
C-96-016-20

**SPECIAL PROVISION
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BDE SPECIAL PROVISIONS

The following special provisions indicated by an "X" are applicable to this contract. An * indicates a new or revised special provision for the letting.

<u>File Name</u>	<u>Pg.</u>		<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80099			Accessible Pedestrian Signals (APS)	April 1, 2003	April 1, 2020
80274			Aggregate Subgrade Improvement	April 1, 2012	April 1, 2016
80192			Automated Flagger Assistance Device	Jan. 1, 2008	
80173			Bituminous Materials Cost Adjustments	Nov. 2, 2006	Aug. 1, 2017
80246			Bituminous Surface Treatment with Fog Seal	Jan. 1, 2020	
* 80436	201	X	Blended Finely Divided Minerals	April 1, 2021	
80241			Bridge Demolition Debris	July 1, 2009	
50261	202	X	Building Removal-Case I (Non-Friable and Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50481	219	X	Building Removal-Case II (Non-Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50491	239	X	Building Removal-Case III (Friable Asbestos)	Sept. 1, 1990	April 1, 2010
50531	250	X	Building Removal-Case IV (No Asbestos)	Sept. 1, 1990	April 1, 2010
80425			Cape Seal	Jan. 1, 2020	Jan. 1, 2021
80384	252	X	Compensable Delay Costs	June 2, 2017	April 1, 2019
80198			Completion Date (via calendar days)	April 1, 2008	
80199			Completion Date (via calendar days) Plus Working Days	April 1, 2008	
80293			Concrete Box Culverts with Skews > 30 Degrees and Design Fills ≤ 5 Feet	April 1, 2012	July 1, 2016
80311			Concrete End Sections for Pipe Culverts	Jan. 1, 2013	April 1, 2016
80261			Construction Air Quality – Diesel Retrofit	June 1, 2010	Nov. 1, 2014
80387			Contrast Preformed Plastic Pavement Marking	Nov. 1, 2017	
80434			Corrugated Plastic Pipe (Culvert and Storm Sewer)	Jan. 1, 2021	
80029	256	X	Disadvantaged Business Enterprise Participation	Sept. 1, 2000	Mar. 2, 2019
80402	266	X	Disposal Fees	Nov. 1, 2018	
80378			Dowel Bar Inserter	Jan. 1, 2017	Jan. 1, 2018
80421	268	X	Electric Service Installation	Jan. 1, 2020	
80415	270	X	Emulsified Asphalts	Aug. 1, 2019	
80423	273	X	Engineer's Field Office Laboratory	Jan. 1, 2020	
80229	276	X	Fuel Cost Adjustment	April 1, 2009	Aug. 1, 2017
80417	279	X	Geotechnical Fabric for Pipe Underdrains and French Drains	Nov. 1, 2019	
80420			Geotextile Retaining Walls	Nov. 1, 2019	
80433			Green Preformed Thermoplastic Pavement Markings	Jan. 1, 2021	
80304			Grooving for Recessed Pavement Markings	Nov. 1, 2012	Nov. 1, 2020
80422			High Tension Cable Median Barrier	Jan. 1, 2020	Nov. 1, 2020
80416	281	X	Hot-Mix Asphalt – Binder and Surface Course	July 2, 2019	Nov. 1, 2019
80398			Hot-Mix Asphalt – Longitudinal Joint Sealant	Aug. 1, 2018	Nov. 1, 2019
80406			Hot-Mix Asphalt – Mixture Design Verification and Production (Modified for I-FIT Data Collection)	Jan. 1, 2019	Jan. 2, 2021
80347			Hot-Mix Asphalt – Pay for Performance Using Percent Within Limits – Jobsite Sampling	Nov. 1, 2014	July 2, 2019
80383			Hot-Mix Asphalt – Quality Control for Performance	April 1, 2017	July 2, 2019
80411	288	X	Luminaires, LED	April 1, 2019	
80393	297	X	Manholes, Valve Vaults, and Flat Slab Tops	Jan. 1, 2018	Mar. 1, 2019
80045			Material Transfer Device	June 15, 1999	Aug. 1, 2014
80418			Mechanically Stabilized Earth Retaining Walls	Nov. 1, 2019	Nov. 1, 2020
80424			Micro-Surfacing and Slurry Sealing	Jan. 1, 2020	Jan. 1, 2021
80428	299	X	Mobilization	April 1, 2020	
80412			Obstruction Warning Luminaires, LED	Aug. 1, 2019	
80430	300	X	Portland Cement Concrete – Haul Time	July 1, 2020	
80359	301	X	Portland Cement Concrete Bridge Deck Curing	April 1, 2015	Nov. 1, 2019
80431	303	X	Portland Cement Concrete Pavement Patching	July 1, 2020	
80432	304	X	Portland Cement Concrete Pavement Placement	July 1, 2020	

<u>File Name</u>	<u>Pg.</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80300		Preformed Plastic Pavement Marking Type D - Inlaid	April 1, 2012	April 1, 2016
34261		Railroad Protective Liability Insurance	Dec. 1, 1986	Jan. 1, 2006
80157	305	X Railroad Protective Liability Insurance (5 and 10)	Jan. 1, 2006	
80306	307	X Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)	Nov. 1, 2012	Jan. 2, 2021
80407	317	X Removal and Disposal of Regulated Substances	Jan. 1, 2019	Jan. 1, 2020
80419	328	X Silt Fence, Inlet Filters, Ground Stabilization and Riprap Filter Fabric	Nov. 1, 2019	April 1, 2020
80395		Sloped Metal End Section for Pipe Culverts	Jan. 1, 2018	
80340		Speed Display Trailer	April 2, 2014	Jan. 1, 2017
80127	334	X Steel Cost Adjustment	April 2, 2014	Aug. 1, 2017
80408	337	X Steel Plate Beam Guardrail Manufacturing	Jan. 1, 2019	
80413		Structural Timber	Aug. 1, 2019	
80397	338	X Subcontractor and DBE Payment Reporting	April 2, 2018	
80391	339	X Subcontractor Mobilization Payments	Nov. 2, 2017	April 1, 2019
* 80437		Submission of Payroll Records	April 1, 2021	
* 80435	340	X Surface Testing of Pavements – IRI	Jan. 1, 2021	April 1, 2021
80298	346	X Temporary Pavement Marking	April 1, 2012	April 1, 2017
80409	349	X Traffic Control Devices – Cones	Jan. 1, 2019	
80410		Traffic Spotters	Jan. 1, 2019	
20338	350	X Training Special Provisions	Oct. 15, 1975	
80318		Traversable Pipe Grate for Concrete End Sections	Jan. 1, 2013	Jan. 1, 2018
80429		Ultra-Thin Bonded Wearing Course	April 1, 2020	
80288	353	X Warm Mix Asphalt	Jan. 1, 2012	April 1, 2016
80302	355	X Weekly DBE Trucking Reports	June 2, 2012	April 2, 2015
80414		Wood Fence Sight Screen	Aug. 1, 2019	April 1, 2020
80427	356	X Work Zone Traffic Control Devices	Mar. 2, 2020	
80071	358	X Working Days	Jan. 1, 2002	

The following special provisions are in the 2021 Supplemental Specifications and Recurring Special Provisions.

<u>File Name</u>	<u>Special Provision Title</u>	<u>New Location(s)</u>	<u>Effective</u>	<u>Revised</u>
80277	Concrete Mix Design – Department Provided	Check Sheet #37	Jan. 1, 2012	April 1, 2016
80405	Elastomeric Bearings	Article 1083.01	Jan. 1, 2019	
80388	Equipment Parking and Storage	Article 701.11	Nov. 1, 2017	
80165	Moisture Cured Urethane Paint System	Article 1008.06	Nov. 1, 2006	Jan. 1, 2010
80349	Pavement Marking Blackout Tape	Articles 701.04, 701.19(f), 701.20(j) and 1095.06	Nov. 1, 2014	April 1, 2016
80371	Pavement Marking Removal	Articles 783.02-783.04, 783.06 and 1101.13	July 1, 2016	
80389	Portland Cement Concrete	Article 1020.04 Table 1 and Note 4	Nov. 1, 2017	
80403	Traffic Barrier Terminal, Type 1 Special	Articles 631.04 and 631.12	Nov. 1, 2018	

The following special provisions have been deleted from use.

<u>File Name</u>	<u>Special Provision Title</u>	<u>Effective</u>	<u>Revised</u>
80317	Surface Testing of Hot-Mix Asphalt Overlays	Jan 1, 2013	Aug. 1, 2019

GUIDE BRIDGE SPECIAL PROVISION INDEX/CHECK SHEET

Effective as of the: January 15, 2021 Letting

Pg #	√	File Name	Title	Effective	Revised
		GBSP 12	Drainage System	June 10, 1994	Jun 24, 2015
		GBSP 13	High-Load Multi-Rotational Bearings	Oct 13, 1988	Oct 23, 2020
		GBSP 14	Jack and Remove Existing Bearings	April 20, 1994	April 13, 2018
		GBSP 15	Three Sided Precast Concrete Structure	July 12, 1994	Dec 21, 2016
		GBSP 16	Jacking Existing Superstructure	Jan 11, 1993	April 13, 2018
		GBSP 18	Modular Expansion Joint	May 19, 1994	Oct 23, 2020
		GBSP 21	Cleaning and Painting Contact Surface Areas of Existing Steel Structures	June 30, 2003	Oct 23, 2020
359	X	GBSP 25	Cleaning and Painting Existing Steel Structures	Oct 2, 2001	Oct 23, 2020
		GBSP 26	Containment and Disposal of Lead Paint Cleaning Residues	Oct 2, 2001	Apr 22, 2016
		GBSP 28	Deck Slab Repair	May 15, 1995	April 13, 2018
		GBSP 29	Bridge Deck Microsilica Concrete Overlay	May 15, 1995	March 1, 2019
		GBSP 30	Bridge Deck Latex Concrete Overlay	May 15, 1995	Oct 20, 2017
		GBSP 31	Bridge Deck High-Reactivity Metakaolin (HRM) Conc Overlay	Jan 21, 2000	March 1, 2019
		GBSP 33	Pedestrian Truss Superstructure	Jan 13, 1998	Oct 23, 2020
		GBSP 34	Concrete Wearing Surface	June 23, 1994	Oct 4, 2016
		GBSP 45	Bridge Deck Thin Polymer Overlay	May 7, 1997	Feb 6, 2013
383	X	GBSP 51	Pipe Underdrain for Structures	May 17, 2000	Oct 23, 2020
		GBSP 53	Structural Repair of Concrete	Mar 15, 2006	Aug 9, 2019
		GBSP 55	Erection of Curved Steel Structures	June 1, 2007	
		GBSP 56	Piling	Nov 14, 1996	Oct 23, 2020
		GBSP 59	Diamond Grinding and Surface Testing Bridge Sections	Dec 6, 2004	Mar 29, 2017
385	X	GBSP 60	Containment and Disposal of Non-Lead Paint Cleaning Residues	Nov 25, 2004	Apr 22, 2016
		GBSP 61	Slipform Parapet	June 1, 2007	March 1, 2019
		GBSP 67	Structural Assessment Reports for Contractor's Means and Methods	Mar 6, 2009	Oct 5, 2015
		GBSP 71	Aggregate Column Ground Improvement	Jan 15, 2009	Oct 15, 2011
		GBSP 72	Bridge Deck Fly Ash or GGBF Slag Concrete Overlay	Jan 18, 2011	March 1, 2019
		GBSP 75	Bond Breaker for Prestressed Concrete Bulb-T Beams	April 19, 2012	Oct 23, 2020
400	X	GBSP 78	Bridge Deck Construction	Oct 22, 2013	Dec 21, 2016
		GBSP 79	Bridge Deck Grooving (Longitudinal)	Dec 29, 2014	Mar 29, 2017
		GBSP 81	Membrane Waterproofing for Buried Structures	Oct 4, 2016	March 1, 2019
		GBSP 82	Metallizing of Structural Steel	Oct 4, 2016	Oct 20, 2017
		GBSP 83	Hot Dip Galvanizing for Structural Steel	Oct 4, 2016	Oct 20, 2017
		GBSP 85	Micropiles	Apr 19, 1996	Oct 23, 2020
402	X	GBSP 86	Drilled Shafts	Oct 5, 2015	Oct 4, 2016
		GBSP 87	Lightweight Cellular Concrete Fill	Nov 11, 2011	Apr 1, 2016
		GBSP 88	Corrugated Structural Plate Structures	Apr 22, 2016	April 13, 2018
		GBSP 89	Prefomed Pavement Joint Seal	Oct 4, 2016	Oct 23, 2020
		GBSP 90	Three Sided Precast Concrete Structure (Special)	Dec 21, 2016	April 13, 2018
414	X	GBSP 91	Crosshole Sonic Logging Testing of Drilled Shafts	Apr 20, 2016	Aug 9, 2019
		GBSP 92	Thermal Integrity Profile Testing of Drilled Shafts	Apr 20, 2016	
		GBSP 93	Prefomed Bridge Joint Seal	Dec 21, 2016	Oct 23, 2020
		GBSP 94	Warranty for Cleaning and Painting Steel Structures	Mar 3, 2000	Nov 24, 2004
418	X	GBSP 96	Erection of Bridge Girders Over or Adjacent to Railroads	Aug 9, 2019	

LIST ANY ADDITIONAL SPECIAL PROVISIONS BELOW

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**STATE OF ILLINOIS
SPECIAL
PROVISIONS**

CONTRACT SPECIFICATIONS

The following Special Provisions supplement the "Standard Specifications for Road and Bridge Construction," (SSRBC) adopted April 1, 2016 and the latest edition of the "Illinois Manual on Uniform Traffic Control Devices for Streets and Highways" (ILMUTCD) and the "Manual of Test Procedures for Materials" in effect on the date of invitation for bids; and the "Supplemental Specifications and Recurring Special Provisions," indicated on the Check Sheet, included herein, which apply to and govern the construction of F.A.U. Route 7985A (Cook Street), F.A.U. Route 7989 (South Grand Avenue) in the City of Springfield, Sangamon County. In case of conflict with any part or parts of said specifications, the said Special Provisions shall take precedence and shall govern.

LOCATION OF PROJECT

The project begins immediately north of Laurel Street on the Norfolk Southern rail corridor and extends north to Capitol Avenue, a distance of approximately 5,425 ft.

DESCRIPTION OF IMPROVEMENT

The roadway reconstruction sections consist of the removal of existing pavement including portions of parking lots, curb and gutter, driveway entrances, sidewalk, fencing, abandon utilities and street appurtenances in the existing right of way and within the proposed right of way along Cook Street and South Grand Avenue, drainage structures, storm sewer, sanitary sewer, erosion control items, roadway pavement, curb and gutter, sidewalk, pavement marking, lighting, and fencing.

The railway reconstruction section consists of earth excavation, structure removal, track removal, and the removal of existing street and parking lot pavement. The proposed improvements include grading, interim track and future tracks, sub-ballast, drainage items, erosion control, and fencing. It also includes construction of two railroad structures over Cook Street, two railroad bridges over South Grand Avenue and associated retaining walls.

The NS work forces will install all ballast and track work.

PRE-BID SITE VISIT

Interested parties are encouraged to attend the non-mandatory, pre-bid site visit to view the inside of the existing buildings that are to be demolished as part of this contract. The site visit will begin on April 9, 2021 at 9:00 a.m. at 1010 E. Edwards, Springfield, IL 62703 and will conclude at 12:00 p.m.

CONSTRUCTION SEQUENCE AND SCHEDULE

The Contractor shall prepare a progress schedule as required by Section 108 of the Standard Specifications. The Contractor shall coordinate items of work in order to keep hazards and traffic inconvenience to homes and businesses to a minimum. The Contractor shall also not interfere with NS railway operations while on NS right-of-way except as approved by the NS. Construction shall be staged as shown on the plans and as listed below to meet the following requirements:

- Cooperation between CWLP Electric and Water utilities for the work they are performing should be included in progress schedules and anticipated staging.
- Cooperation between other utilities for the work they are performing should be included in progress schedule and anticipated staging.
- Lane closures on Cook Street and South Grand Avenue will not be allowed until a firm date for delivery of structural steel is established.
- A minimum of two lanes of traffic shall remain open at all times on Cook Street and South Grand Avenue except as noted below. Cook Street and South Grand Avenue shall only be reduced to two lanes for a maximum of 180 calendar days for each street. Should the Contractor fail to satisfy this time requirement, the Contractor shall be liable to the Department for liquidated damages of \$1,000 per calendar day at each street for each day beyond the 180 calendar days. The liquidated damages shall be administered in accordance with Article 108.09 at the Standard Specifications and any other additional special provisions which may be attached here in which supplements Article 108.09.
- Cook Street may be closed for the weekend a maximum of one time using the temporary detour shown in the plans. The weekend closure will be allowed for the following occasion:

- Removing the existing railroad structure.

The weekend closure is limited to the hours of 7:00 PM on Friday to 7:00 AM on the following Monday.

- South Grand Avenue may be closed for the weekend a maximum of one time using the temporary detour shown in the plans. The weekend closure will be allowed for the following occasion:

- Removing the existing railroad structure.

The weekend closure is limited to the hours of 7:00 PM on Friday to 7:00 AM on the following Monday.

- Cook Street may be closed for ten consecutive calendar days a maximum of two times using the temporary detour shown in the plans. The closure will be allowed for each of the following occasions:

- Erecting structural steel for the proposed NS bridge.
- Erecting structural steel for the proposed UP bridge.

The closures are limited to the hours of 7:00 PM on Friday to 7:00 AM on the second following Monday. Beginning on the Monday at the end of each closure to erect structural steel, Cook Street may be closed for four consecutive nights during the hours of 8:00 PM and 5:00 AM to finish erecting structural steel.

- South Grand Avenue may be closed for ten consecutive calendar days a maximum of two times using the temporary detour shown in the plans. The closure will be allowed for each of the following occasions:

- Erecting structural steel for the proposed NS bridge.
- Erecting structural steel for the proposed UP bridge.

The closures are limited to the hours of 7:00 PM on Friday to 6:00 AM on the second following Monday. Beginning on the Monday at the end of each closure to erect structural steel, South Grand Avenue may be closed for four consecutive nights during the hours of 8:00 PM and 5:00 AM to finish erecting structural steel.

- Cook Street and South Grand Avenue may not be closed at the same time or during the Illinois State Fair.
- Should the Contractor fail to complete the Cook Street and South Grand Avenue closure work within the specified amount of time, the Contractor shall be liable to the Department for liquidated damages of \$6,500 per hour for each hour beyond the limit. For purposes of calculating damages, a time period greater than one half hour but less than one hour shall be considered one hour. The damage rate is an equitable rule for measurement of the Department's actual loss and fairly takes into account the loss of use of the roadway and the failure to meet this work schedule if this work is delayed in completion. The liquidated damages shall be administered in accordance with Article 108.09 of the Standard Specifications and any other additional special provision which may be attached herein which supplements Article 108.09.

WORKING DAYS

Working days shall be according to Section 108.04 of the SSRBC. The Contractor shall complete the work within 235 working days. A construction progress schedule indicating project milestones shall be completed and strictly adhered to by the Contractor unless a request to modify the schedule is submitted in writing and approved by the Engineer.

Working days may be suspended by the Engineer at such time that the construction activities by railroad personnel inhibit or become the controlling item of work.

TRAFFIC CONTROL PLAN

Description: Traffic control shall be in accordance with the applicable sections of the Standard Specifications for Road and Bridge Construction (SSRBC), the applicable guidelines contained in the Illinois Manual on Uniform Traffic Control Devices for Streets and Highways, these Special Provisions, any special details and Highway Standards contained herein and in the plans.

General: Special attention is called to Sections 107 and 701 through 705 of the Standard Specifications for Road and Bridge Construction, and as amended by the Supplemental Specifications, Recurring Special Provisions, the Special Provisions contained herein, and the following highway standards relating to traffic control.

701006, 701601, 701801, 701901, BLR 21

The Contractor shall notify the Engineer and the City of Springfield Department of Public Works

at least 72 hours in advance of activating the traffic control to close one lane of traffic in each direction on South Grand Avenue and Cook Street. District 6 Operations Traffic Signal Section shall be contacted at (217) 524-9161 to allow for adjustment of traffic signals, if necessary, near the lane closures. City of Springfield Public Works phone number is (217) 789-2255.

The Contractor shall coordinate the items of work in order to keep hazards and traffic inconveniences to a minimum, as specified below.

Traffic Control and Protection Standard 701006 shall be used for construction within 15 feet on South Grand Avenue and Cook Street and as shown on the plans.

Traffic Control and Protection Standard 701601 shall be used for lane closures on South Grand Avenue and Cook Street and as shown on the plans.

Traffic Control and Protection Standard 701801 shall be used for all sidewalk closures on South Grand Avenue and Cook Street and as shown on the plans.

Traffic Control and Protection Standard 701901 shall be used for traffic control devices during construction.

Traffic Control and Protection Standard BLR 21 shall be used for road closure for the three closures (six total) of South Grand Avenue and Cook Street which will require additional Type III barricades. Prior to beginning any work on the structure or roadway that are included in this project, the Contractor shall erect break away post mounted "Road Construction Ahead" signs, W20-I103(O)-48, as shown on the staging plans.

Finishing earth embankment, HMA surface course, curb and gutter, seeding, and pavement markings may be completed after the road is back open to normal traffic utilizing flaggers in accordance with Traffic Control and Protection, Standards 701601 for necessary lane closures.

The Contractor shall provide, erect, and maintain all the necessary barricades, cones, drums, and lights for the warning and protection of traffic, as required by Sections 107 and 701 through 703 of the Standard Specifications, and as modified.

All advance warning signs shall be in new or like new condition at the start of the project. If an advanced warning sign is damaged or becomes unreadable, the sign shall be replaced by a new or like new sign.

Traffic shall be maintained as described in the traffic control standards or as directed by the Engineer. All debris shall be removed from the pavement and shoulders prior to removal of traffic control.

In addition, to the flaggers required by the various standards, additional flaggers shall be provided by the Contractor, if required by the Engineer, and they will be paid in accordance with Article 109.04 of the Standard Specifications.

The Contractor will be responsible for the traffic devices at all times during construction

activities and throughout any winter shutdown periods.

Traffic Control and Protection Standards included in these plans shall always be installed and operational during construction of this section.

All commercial and private entrances along the mainline, which are part of this improvement, shall have suitable access, as determined by the Engineer, at all times during construction of this project. All weather access shall be a minimum of 10.0 ft wide. The Contractor may not deviate from this provision, except when he/she has written permission from the owner/tenant to cut off access to their property for a specific period of time.

Furnishing, placing and removing all traffic control and protection (such as Type III barricades, drums, vertical panels, stop signs, etc.) required will not be measured for payment separately and will be considered as part of the traffic control and protection pay items included in the contract.

All permanent pavement markings will be paid for separately.

All other traffic control and protection required for the completion of this improvement will not be paid for separately but will be considered as part of the unit bid prices for the pay item included in the contract.

The contractor shall provide the name and phone number of a contact on a twenty-four (24) hour basis in the event an accident or other unforeseen damage occurs that necessitates replacement or resetting of traffic control items.

Traffic Control and Protection Standards 701601, 701801 and BLR 21 shall be paid for at the contract lump sum price.

During the road closures, the Contractor shall notify the Engineer at least 21 days in advance of each closure. The closure shall begin only after the City has notified the local emergency services, school system, and media. This notification must come at least two weeks in advance of the closure.

Basis of Payment: Traffic Control and Protection Standards 701601, 701801 and BLR 21 will not be paid for separately but will be included in the contract lump sum price for TRAFFIC CONTROL AND PROTECTION (SPECIAL).

All detour signing and any additional traffic control and protection, including those standards listed above, as shown on the plans and described in these specifications will be measured on a lump sum basis and paid for at the contract lump sum price for TRAFFIC CONTROL AND PROTECTION, (SPECIAL). This work shall include furnishing, placement, maintenance, replacement, relocating and removal of the work zone traffic control devices used for the purpose of regulating, warning, directing, closing and detouring traffic on the local streets impacted by the construction of the project.

CHANGEABLE MESSAGE SIGN

Description: This work shall consist of providing all equipment and labor for furnishing and placing portable changeable message signs.

General: This work shall be performed in accordance with the applicable Articles of Section 701 of the Standard Specifications except as modified herein.

All changeable message signs shall be supplied by the Contractor. The placement of any sign will begin no later than 7 calendar days in advance of the upcoming closure at locations as specified by the District Traffic Control Technician or Engineer. The changeable message signs are in addition to any changeable message sign that may be required and is noted on the applicable Traffic Control and Protection Highway Standards. Signs will be placed on S. Grand Ave. and Cook Street as shown on the detour plans or as designated by the Engineer. The message to be shown on the message board will also be at the discretion of the Engineer and will have to change for the road closures.

Basis of Payment: Changeable Message Signs shall be measured and paid for at the contract unit price per calendar day for CHANGEABLE MESSAGE SIGN. Changeable message signs specified in the Traffic Control and Protection Highway Standards shall be measured and paid for per the applicable pay item for that work.

DETOUR SIGNING

Description: This work shall consist of furnishing, installation, maintenance, relocation, and removal of temporary detour signing as shown on the plans, as directed by the Engineer, in accordance with Section 701 of the Standard Specifications, and as herein specified.

General: Detour Signing required under this item is that which is required to implement temporary detours during the traffic closures for South Grand Avenue and Cook Street. When detour signing shall be placed shall be coordinated with the Engineer and the City Traffic Engineer.

Detour Signing required under this item includes barricades/drums, Type III barricades, and all temporary signing necessary to mark the detours as shown on the plan detour sheets. This item will also include changing the message on the changeable message signs, though the changeable message signs will be paid for separately.

This work will also include covering existing signs that conflict with any of the detour signs and shall also include covering or removing the detour signs when the detour is not in effect as directed by the Engineer.

The Contractor shall coordinate the items of work to keep hazards and traffic inconveniences to a minimum.

All detour signs shall be in new or like new condition at the start of the project. If a sign is

damaged or becomes unreadable, the sign shall be replaced by a new or like new sign.

Basis of Payment: All the work in this special provision will be paid for at the contract unit price per Lump Sum for DETOUR SIGNING.

STATUS OF UTILITIES TO BE ADJUSTED

The following utilities are involved in this project. The utility companies have provided the estimated dates.

Name & Address of Utility	Type	Location	Estimated Date of Relocation Completed
Ameren CILCO North Mr. Rick Combs 825 North MacArthur Blvd. Springfield, IL 62702 Phone: (217) 753-5187	Gas	Throughout the Project	During Construction
Ameren CILCO North Mr. Nicholas Reed 825 North MacArthur Blvd. Springfield, IL 62702 Phone:	Electric	Throughout the Project	During Construction
City Water, Light & Power Mr. Michael Johnson 401 North 11th Street Springfield, IL 62702 Phone: (217) 789-2323 Ext. 1617	Water	Throughout the Project	During Construction
City Water, Light & Power Mr. Shaun Anders 1008 East Miller Street Springfield, Illinois 62702 Phone: (217) 321-1323	Electric	Throughout the Project	During Construction
City of Springfield (Sewer Department) Mr. Vince Smith Room 203 Municipal Center W. 300 S. 7 th St. Springfield, IL 62701 Phone: (217) 789-2255	Sewer	Throughout the Project	Completed By Contractor
City of Springfield (Public Works) Mr. Thomas Heavisides Room 203 Municipal Center W. 300 S. 7 th St. Springfield, IL 62701 Phone: (217) 789-2255	Fiber Optic/Traffic	South Grand Avenue, Cook Street	To Remain

Sangamon County Water Reclamation District Mr. Gregg Humphrey 3000 North 8 th Street Springfield, IL 62707 Phone: (217) 528-0491	Sewer	Throughout the Project	Completed By Contractor
Comcast Mr. David Bly 711 South Dirksen Parkway Springfield, IL 62703 Phone: (224) 229-5267	Aerial Cable	Throughout the Project	During Construction
AT&T Distribution Mr. James Darr 1640 E. Hazel Dell Rd. Springfield, IL 62703 Phone: (217) 789-8771	Fiber Optic/Telephone	Throughout the Project	During Construction
CenturyLink Mr. Bryan Hankins 624 White Oak Drive Chatham, IL 62629 Phone: (720) 480-3364	Fiber Optic	South Grand Avenue	During Construction
Norfolk Southern Corporation Mr. Scott Overbey 1200 Peachtree Street NE Atlanta, GA 30309 Phone: (404) 582-5588	RR Communication	Throughout the Project	During Construction
Windstream, KDL, Inc. Mr. David Ferreira 211-B SW Adams St. Peoria, IL 61602 Phone: (309) 282-3110	Fiber Optic	Throughout the Project	During Construction

The above represents the best information of the Department and is only included for the convenience of the bidder. The applicable provisions of Articles 105.07, 107.20, 107.37, 107.38, 107.39, 107.40 and 108.02 of the Standard Specifications for Road and Bridge Construction shall apply.

The estimated utility relocation dates should be part of the progress schedule submitted by the Contractor. If any utility adjustments or relocations have not been completed and when required by the Contractor's operations, the Contractor should notify the Engineer in writing. A request for an extension of time will be considered to the extent the Contractor's critical path schedule is affected.

ASSURANCES AND CERTIFICATIONS RELATED TO THE CITY'S CRISI GRANT

Contractor agrees to comply (and require any subcontractors, successors, transferees, and/or assignees to comply) with all applicable provisions governing the FRA's access to records, accounts, documents, information, facilities, and staff. Contractor must comply with any program or compliance reviews, and/or complaint investigations conducted by the FRA.

Contractor must keep records, reports, and submit the material for review upon request to FRA, or its designee in a timely, complete, and accurate way. Additionally, contractor must comply with all other reporting, data collection, and evaluation requirements, as prescribed by law or detailed in program guidance.

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally assisted programs of the U.S. Department of Transportation, Federal Railroad Administration (FRA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor’s obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FRA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the FRA, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance:** In the event of a contractor’s noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the FRA may determine to be appropriate, including, but not limited to:

a. withholding payments to the contractor under the contract until the contractor complies; and/or

b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the FRA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the “contractor”) agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

Potentially Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 C.F.R. Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 C.F.R. Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 U.S.C. § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms “programs or activities” to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 –

12189) as implemented by Department of Transportation regulations at 49 C.F.R. Parts 37 and 38;

- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

**CERTIFICATION REGARDING DEBARMENT, SUSPENSION, AND OTHER
RESPONSIBILITY MATTERS -- PRIMARY COVERED TRANSACTIONS**

C.F.R. Parts 180 and 1200

These assurances and certifications are applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FRA approval or that is estimated to cost \$25,000 or more – as defined in 2 C.F.R. Parts 180 and 1200.

By signing and submitting the Technical Application and by entering into this agreement, the Recipient is providing the assurances and certifications for First Tier Participants and Lower Tier Participants under this agreement, as set out below.

1. Instructions for Certification – First Tier Participants:

- a. The prospective first tier participant is providing the certification set out below.
- b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms “covered transaction,” “civil judgment,” “debarred,” “suspended,” “ineligible,” “participant,” “person,” “principal,” and “voluntarily excluded,” as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers to any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions,” provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause.

The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

- a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:
- (1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;
 - (2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment, including a civil settlement, rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and
 - (4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 C.F.R. Parts 180 and 1200)

- a. The prospective lower tier participant is providing the certification set out below.
- b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to

other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms “covered transaction,” “civil settlement,” “debarred,” “suspended,” “ineligible,” “participant,” “person,” “principal,” and “voluntarily excluded,” as used in this clause, are defined in 2 C.F.R. Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a Recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a Recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled “Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction,” without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

REQUIREMENTS REGARDING DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER ANY FEDERAL LAW

As required by sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014 (Pub. L. 113-76), and similar provisions in subsequent appropriations acts, and implemented through USDOT Order 4200.6, the funds provided under this contract shall not be used to enter into a contract, memorandum of understanding, or cooperative agreement with, make a grant to, or provide a loan or loan guarantee to, any corporation that:

- (1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless an agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government; or
- (2) Was convicted of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless an agency has considered suspension or debarment of the corporation and made a determination that suspension or debarment is not necessary to protect the interests of the Government.

The Recipient therefore agrees:

1. **Definitions.** For the purposes of this exhibit, the following definitions apply:

“Covered Transaction” means a transaction that uses any funds under this award and that is a contract, memorandum of understanding, cooperative agreement, grant, loan, or loan guarantee.

“Felony Conviction” means a conviction within the preceding 24 months of a felony criminal

violation under any Federal law and includes conviction of an offense defined in a section of the United States Code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. 3559.

“Participant” means the Recipient, an entity who submits a proposal for a Covered Transaction, or an entity who enters into a Covered Transaction.

“Tax Delinquency” means an unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2. **Mandatory Check in the System for Award Management.** Before entering a Covered Transaction with another entity, a Participant shall check the System for Award Management (the “SAM”) at <http://www.sam.gov/> for an entry describing that entity.

3. **Mandatory Certifications.** Before entering a Covered Transaction with another entity, a Participant shall require that entity to:

- (1) Certify whether the entity has a Tax Delinquency; and
- (2) Certify whether the entity has a Felony Conviction.

4. **Prohibition.** If

- (1) the SAM entry for an entity indicates that the entity has a Tax Delinquency or a Federal Conviction;
- (2) an entity provides an affirmative response to either certification in section 3; or
- (3) an entity’s certification under section 3 was inaccurate when made or became inaccurate after being made then a Participant shall not enter or continue a Covered Transaction with that entity unless the USDOT has determined in writing that suspension or debarment of that entity are not necessary to protect the interests of the Government.

5. **Mandatory Notice to the USDOT.**

- (a) If the SAM entry for a Participant indicates that the Participant has a Tax Delinquency or a Felony Conviction, the Recipient shall notify the USDOT in writing of that entry.
- (b) If a Participant provides an affirmative response to either certification in section 1, the Recipient shall notify the USDOT in writing of that affirmative response.
- (c) If the Recipient knows that a Participant’s certification under section 1 was inaccurate when made or became inaccurate after being made, the Recipient shall notify the USDOT in writing of that inaccuracy.

6. **Flow Down.** For all Covered Transactions, including all tiers of subcontracts and subawards, the Recipient shall:

- (1) require the SAM check in section 2;
- (2) require the certifications in section 3;
- (3) include the prohibition in section 4; and
- (4) require all Participants to notify the Recipient in writing of any information that would require the Recipient to notify the USDOT under section 5.

[END OF ASSURANCES AND CERTIFICATIONS]

ROADWAY

ABANDON AND FILL EXISTING STORM SEWER

Description: This work shall consist of abandoning and filling storm sewer at the locations shown on S. Grand Ave and Cook Street as designated on the plans or as directed by the Engineer, with Controlled Low Strength Material (CLSM) according to Articles 593.02 and 593.03 of the SSRBC and as specified in this special provision.

CLSM shall meet the requirements of Section 1019 of the SSRBC.

The portion of the sewer to be filled shall be cleaned and inspected to identify connections, locate obstructions, and assess the condition of the pipe prior to CLSM placement. The Engineer shall be notified of any connections that were not identified in the plans to be abandoned, removed or reconnected. Irregularities, open joints or broken pipe shall be documented, and the calculated fill volume shall be adjusted to account for anomalies.

Termini of storm sewers to be filled shall be plugged with Class SI concrete or brick and mortar. The plug shall be adequate to withstand the hydrostatic load created during the filling operation. If the plug fails during construction, the Contractor shall be responsible for the cost of repairing the plug and filling the remainder of the pipe.

CLSM shall be placed in a manner that allows all air or water to be displaced as the CLSM fills the pipe and any intermediate structures.

Basis of Payment: All material, equipment and labor to perform this work shall be paid for at the contract unit price per foot for ABANDON AND FILL EXISTING STORM SEWER.

BUILDING REMOVAL

Description: This work shall consist of removing buildings listed in the table below according the following BDE Special Provisions:

- Building Removal – Case I (Non-friable and Friable Asbestos Abatement)
- Building Removal – Case II (Non-Friable Asbestos Abatement)
- Building Removal – Case III (Friable Asbestos Abatement)
- Building Removal – Case IV (No Asbestos)

The asbestos abatement case for each building is identified in the table below.

In addition to the requirements of the BDE Special Provisions, basement floors shall be broken up or perforated to prevent entrapment of water.

Building Removal No. 9 shall include the following work on the workshop building adjacent to and east of Building No. 9: Remove the brick façade on the south face of the workshop to the

outside plane of the west CMU wall of the workshop. Infill the cavity space between the brick façade and CMU with clay brick salvaged from the demolished south façade. Cut the clay tile coping on top of the south parapet wall of the workshop flush to west CMU wall of the workshop. Cap and seal the end of the parapet with white or gray painted sheet metal.

Basis of Payment: This work, including breaking or perforating basement floors and work on the workshop building east of Building No. 9, shall be paid for at the contract unit prices for the pay items listed in the BDE Special Provisions.

BUILDING REMOVAL LIST

Bldg. No.	Parcel No.	Parcel Address	Building Type	Asbestos Abatement Case
1	SR0134	1001 & 1003 E Edwards St.	Commercial	II
2	SR0134	1010 E Edwards St.	Commercial	III
3	SR0135	709 Barrett St.	Industrial	I
4	SR0136	929 E South Grand Ave.	Commercial	II
5	SR0137	1311 S 11 th St.	Commercial	IV
6	SR0137	1311 S 11 th St.	Commercial	II
7	SR0137	1311 S 11 th St.	Commercial	IV
8	SR0137A	1311 S 11 th St.	Cell Tower and Bldg.	IV
9	SR0137	1021 E South Grand Ave.	Commercial	II

CATCH BASINS TO BE RECONSTRUCTED (SPECIAL)

Description: This work shall consist of reconstructing the catch basin on the south side of the Cook Street catch basin to allow a 24-in. storm sewer to be installed and to flow to the south. Also included in this pay item will be abandonment of the 24-in. outfall sewer to the north by plugging the pipe with Class SI Concrete or brick and mortar to the satisfaction of the Engineer.

If the existing catch basin is damaged during the reconstruction it shall be the responsibility of the Contractor to repair the damaged area and no additional compensation will be allowed.

Basis of Payment: All material, equipment and labor to perform this work shall be paid for at the contract unit price per each for CATCH BASINS TO BE RECONSTRUCTED (SPECIAL).

CHAIN LINK FENCE REMOVAL

Description: This work shall consist of all labor and equipment necessary for the complete removal and disposal of the existing chain link fence on the S. Grand Ave. retaining wall and other locations as detailed in the plans. This work shall be completed in accordance with the applicable portions of Section 664 of the IDOT SSRBC and as directed by the Engineer. All material included with this removal shall be disposed of off-site by the Contractor.

Basis of Payment: This work shall be paid for at the contract unit price per foot for CHAIN LINK FENCE REMOVAL which price shall include all labor and equipment necessary to remove and properly dispose of the fence to the satisfaction of the Engineer.

CLEARING

Description: This work shall be in accordance with Section 201 of the Standard Specifications. In addition to the items listed in Section 201.01(a), clearing shall include stockpiled railroad ties or rail, poles, broken concrete and asphalt, concrete blocks, bricks, pallets, posts, pipes, scrap materials, discarded household furniture, appliances and goods, sheds and outbuildings not listed for payment and any other unclassified material at locations not specifically listed in the schedule of quantities as being measured for payment.

Basis of Payment: CLEARING will not be measured for payment.

CONTROLLED LOW-STRENGTH MATERIAL

Description: This work shall consist of filling steam vaults, handholes or other structures according to Section 593 of the SSRBC at locations directed by the Engineer.

General: Abandoned utility manholes and vaults are potentially located within the project limits. The number, size and location of these are unknown, but if encountered, the Engineer should be contacted immediately. Any castings or lids encountered shall be stockpiled and delivered to the City of Springfield. The Contractor shall determine if any live utilities are located within the vault that would prevent it from being filled. The Contractor shall notify the Engineer whether or not any live utilities are located within the vault and whether it is acceptable to be filled. Should the vault be filled, all open pipe connections shall be grouted shut and the vault filled with controlled low-strength material to the level of the proposed subgrade.

Other structures not intended to be removed by other means as a part of the contract, encountered by the Contractor and known not to contain live utilities, shall be filled with controlled low-strength material, upon approval of the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price per cubic yard for CONTROLLED LOW-STRENGTH MATERIAL.

DEMOLITION OF EXISTING PUMP STATION

South Grand Location: This work shall consist of the complete removal and disposal of the pump station located on S. Grand Ave. Included in this removal will be the complete structure, pumps, all electrical and mechanical devices inside and outside of the pump station including all wires and pipes and will also include all stairs and railing leading to the pump station. Any holes shall be filled with a suitable material to establish landscape growth as directed by the Engineer.

Cook Street Location: This work shall consist of the complete removal of the pump station located on Cook Street. Included in this removal will be the complete structure, pumps and all electrical and mechanical devices inside and outside of the pump station including all wires.

The pump station structure shall be removed to 6” below the existing ground elevation. After the removal of this portion of the pump station the remaining portion of the pump station shall be filled with Controlled Low Strength Material (CLSM) according to Articles 593.02 and 593.03 of the SSRBC.

The portion of the pump station to be filled shall be cleaned and inspected to assess the condition of the remaining structure prior to CLSM placement. The remaining 6” shall be finished with Portland cement concrete driveway pavement.

Also included in this pay item will be abandonment of the 24-in. outfall sewers by plugging the pipes with Class SI Concrete or brick and mortar to the satisfaction of the Engineer.

Basis of Payment: All material, equipment and labor to perform this work shall be paid for at the contract unit price per lump sum for DEMOLITION OF EXISTING PUMP STATION which price shall include all labor and equipment necessary to remove and properly dispose of the pump station and all its contents to the satisfaction of the Engineer.

DRAINAGE STRUCTURES (PUMP STATION)

General: This work shall consist of constructing Drainage Structure No. 2.

Description: Drainage Structures shall be furnished and installed in accordance with Sections 516 and 602 of the Standard Specifications with exceptions shown on the Plans and as specified herein.

Drainage Structure No. 2 shall be excavated using a vertical shaft boring machine. The Contractor shall submit a detailed excavation plan and a detailed grout installation and drainage structure installation plan to the Engineer for approval prior to commencing work. The plans shall be sealed by a professional engineer. The plans shall include proposed shaft dimensions, proposed shoring, either permanent or temporary casing, and staging. The excavation plan shall include drawings and design calculations for temporary or permanent casing. The calculations shall be prepared and sealed by an Illinois Licensed Structural Engineer. This approval will not relieve the Contractor of responsibility for the safety of the excavation. The shoring shall be designed for earth loads and HS-20 live load for vehicle traffic. The plan should address

completely filling the space between the structure and the rock face and shall address buoyancy issues during installation. Should there be groundwater present in the annular space between the structure and the rock face, the Contractor shall use a grout formulated for curing under water and shall install the grout from the bottom-up. The grout shall conform to ASTM C-1107 and shall have a minimum compressive strength of 5,000 psi after twenty-eight (28) days. In lieu of non-shrink grout, may use Class DS concrete with 8-10" slump.

Each Drainage Structure shall be excavated, installed, and backfilled completely prior to commencing construction on another Drainage Structure. At no time shall there be simultaneous construction on multiple drainage structures.

Material removed from the excavation shall be disposed of in accordance with Section 202.03 of the Standard Specifications.

Once each of the vertical shafts have been excavated, a 12-in. bedding of CA-7 aggregate or class SI concrete shall be placed in the bottom of the shaft and leveled to form a flat base to set the Drainage Structures.

Drainage Structures shall be precast reinforced concrete manholes conforming to ASTM C-478 and ART. 1042 of SSRBC "Precast concrete products." The structures shall be water-tight. The precast manhole shall have a minimum compressive strength of 4,000 psi at twenty-eight (28) days.

All penetrations through the walls of the drainage structure shall be sealed with a non-shrink grout.

The drainage structure sections shall be a minimum of 4-ft tall with the exception of the final section. Each section shall be sealed with two (2) strips of butyl rubber sealant. Joints in the butyl rubber sealant shall be overlapped to prevent gaps.

The drainage structure shall be checked after the installation of each section to ensure a true vertical installation. If the alignment is off, the Contractor shall take corrective action to shim the structure back to level.

The exterior and the bottom of the base of the structures shall receive two coats of asphalt emulsion waterproofing in accordance with Section 503.18 of the Standard Specifications.

The annular space between the structures and the edge of the shaft shall be filled with non-shrink grout between the elevations shown on the plans. From the top of the grout to the surface, the annular space between the manhole and the edge of the shaft shall be filled with controlled low strength material, mix 2 in accordance with Section 593 of the SSRBC or non-shrink grout.

After installation is complete, if there are water leaks at joints, the Contractor shall waterproof the leaks using drilled ports around the leak and a hydrophilic grout.

Openings in the structures for pipes shall be blocked out during manufacturing with knockouts left in place during initial installation.

The top barrels of the Drainage Structures shall be flat. The precast lids shall be sealed to the top ring section with a double row of butyl mastic. The precast lids shall have a cast in place access frames and hatches per the plans. The frame and hatch design live load is AASHTO HS-20 truck load and alternate tandem loads.

Chamfered inverts shall be installed in the structures as shown on the plans. The invert shall be constructed of Class SI concrete conforming to Section 1020.04 of the Standard Specifications. The chamfer and sloped sidewalls in Drainage Structures, No. 2 shall be per the pump manufacturer's recommendations to provide sufficient space between the volute and the invert of the station. The sidewalls shall be sloped to direct debris to the pumps and promote self-cleaning of the structure invert.

General: This work includes all mobilization, excavation, temporary or permanent shoring/casing, labor, materials and equipment required to manufacture, furnish, and install the drainage structures, precast concrete, lid, access frame and hatch, non-shrink grout, controlled low strength material, butyl rubber sealant, asphalt emulsion waterproofing, CA-7, concrete, removal and disposal of excess material and other incidental items as shown on the plans.

Basis of Payment: This work will be paid for at the contract unit price per each for DRAINAGE STRUCTURES No. 2.

EARTH EXCAVATION

Description: This work shall be according to Section 202 of the SSRBC in addition to the following requirements for drainage.

Drainage: The work shall be maintained so that positive drainage is provided at all times. Some drainage structures will have their outlet pipes constructed in later stages. Temporary ditches, temporary sump pumps or other methods determined by the Contractor shall be used to provide positive drainage during excavation and to protect adjacent property from damage. The method and procedure to provide positive drainage during excavation shall be submitted and approved by the Engineer prior to excavation. If the Engineer determines during construction that the positive drainage is not adequate, the Contractor shall correct this to the satisfaction of the Engineer. This work shall be included in the contract unit price for EARTH EXCAVATION.

FENCE REMOVAL

Description: This work shall consist of removing existing fencing, posts, barbed wire, supports, foundations, gates and associated hardware according to Sections 201, 664 and 665 of the SSRBC and constructing end posts and associated hardware where required to terminate existing fence at locations shown on the plans or as directed by the Engineer.

General: All material included with this removal shall be disposed of off-site by the Contractor. End post and associated hardware to terminate existing chain link fence shall be according to

Standard 664001 and Section 664 of the SSRBC. End posts and associated hardware to terminate existing woven wire fence shall be according to Standard 665001 and Section 665 of the SSRBC.

Basis of Payment: This work including end posts and associated hardware shall be paid for at the contract unit price per foot for FENCE REMOVAL.

FILLING CATCH BASINS, SPECIAL

Description: This work shall consist of cutting off the top of the S. Grand Ave. catch basin to the elevation as shown on the plans without damaging the existing pipes which will be installed in the new 7- foot diameter manhole which will set on top of the existing catch basin and will incorporate all pipes remaining as shown on the plans. After the removal of the top part of the catch basin, the remaining portion of the catch basin shall be filled with Controlled Low Strength Material (CLSM) according to Articles 593.02 and 593.03 of the SSRBC. CLSM shall meet the requirements of Section 1019 of the SSRBC.

The portion of the catch basin to be filled shall be cleaned and inspected to assess the condition of the catch basin and the connections of the pipes prior to CLSM placement. The Engineer shall be notified of any connections that were not identified in the plans to be abandoned, removed or reconnected. Irregularities, open joints or broken pipe shall be documented, and the calculated fill volume shall be adjusted to account for anomalies.

Basis of Payment: All material, equipment and labor to perform this work shall be paid for at the contract unit price per each for FILLING CATCH BASINS, SPECIAL and shall be in accordance with Section 605 of the SSRBC and to the satisfaction of the Engineer.

IDOT TRAINING PROGRAM GRADUATE ON-THE-JOB TRAINING SPECIAL PROVISION (TPG)

Effective: August 1, 2012 Revised: February 2, 2017

In addition to the Contractor's equal employment opportunity (EEO) affirmative action efforts undertaken as required by this Contract, the Contractor is encouraged to participate in the incentive program described below to provide additional on-the-job training to certified graduates of the IDOT pre-apprenticeship training program, as outlined in this Special Provision.

IDOT funds, and various Illinois community colleges operate, pre-apprenticeship training programs throughout the State to provide training and skill-improvement opportunities to promote the increased employment of minority groups, disadvantaged persons and women in all aspects of the highway construction industry. The intent of this IDOT Pre-Apprenticeship Training Program Graduate (TPG) special provision (Special Provision) is to place these certified program graduates on the project site for this Contract in order to provide the graduates with meaningful on-the-job training. Pursuant to this Special Provision, the Contractor must make every reasonable effort to recruit and employ certified TPG trainees to the extent such individuals

are available within a practicable distance of the project site.

Specifically, participation of the Contractor or its subcontractor in the Program entitles the participant to reimbursement for graduates' hourly wages at \$15.00 per hour per utilized TPG trainee, subject to the terms of this Special Provision. Reimbursement payment will be made even though the Contractor or subcontractor may also receive additional training program funds from other non-IDOT sources for other non-TPG trainees on the Contract, provided such other source does not specifically prohibit the Contractor or subcontractor from receiving reimbursement from another entity through another program, such as IDOT through the TPG program. With regard to any IDOT funded construction training program other than TPG, however, additional reimbursement for other IDOT programs will not be made beyond the TPG Program described in this Special Provision when the TPG Program is utilized.

No payment will be made to the Contractor if the Contractor or subcontractor fails to provide the required on-site training to TPG trainees, as solely determined by IDOT. A TPG trainee must begin training on the project as soon as the start of work that utilizes the relevant trade skill and the TPG trainee must remain on the project site through completion of the Contract, so long as training opportunities continue to exist in the relevant work classification. Should a TPG trainee's employment end in advance of the completion of the Contract, the Contractor must promptly notify the IDOT District EEO Officer for the Contract that the TPG's involvement in the Contract has ended. The Contractor must supply a written report for the reason the TPG trainee involvement terminated, the hours completed by the TPG trainee on the Contract, and the number of hours for which the incentive payment provided under this Special Provision will be, or has been claimed for the separated TPG trainee.

Finally, the Contractor must maintain all records it creates as a result of participation in the Program on the Contract, and furnish periodic written reports to the IDOT District EEO Officer that document its contractual performance under and compliance with this Special Provision. Finally, through participation in the Program and reimbursement of wages, the Contractor is not relieved of, and IDOT has not waived, the requirements of any federal or state labor or employment law applicable to TPG workers, including compliance with the Illinois Prevailing Wage Act.

Method of Measurement: The unit of measurement is in hours.

Basis of Payment: This work will be paid for at the contract unit price of \$15.00 per hour for each utilized certified TPG Program trainee (TRAINEES TRAINING PROGRAM GRADUATE). The estimated total number of hours, unit price, and total price must be included in the schedule of prices for the Contract submitted by Contractor prior to beginning work. The initial number of TPG trainees for which the incentive is available for this contract is 10.

The Department has contracted with several educational institutions to provide screening, tutoring and pre-training to individuals interested in working as a TPG trainee in various areas of common construction trade work. Only individuals who have successfully completed a PreApprenticeship Training Program at these IDOT approved institutions are eligible to be TPG trainees. To obtain a list of institutions that can connect the Contractor with eligible TPG trainees,

the Contractor may contact: HCCTP TPG Program Coordinator, Office of Business and Workforce Diversity (IDOT OBWD), Room 319, Illinois Department of Transportation, 2300 S. Dirksen Parkway, Springfield, Illinois 62764. Prior to commencing construction with the utilization of a TPG trainee, the Contractor must submit documentation to the IDOT District EEO Officer for the Contract that provides the names and contact information of the TPG trainee(s) to be trained in each selected work classification, proof that that the TPG trainee(s) has successfully completed a Pre-Apprenticeship Training Program, proof that the TPG is in an Apprenticeship Training Program approved by the U.S. Department of Labor Bureau of Apprenticeship Training, and the start date for training in each of the applicable work classifications.

To receive payment, the Contractor must provide training opportunities aimed at developing a full journeyworker in the type of trade or job classification involved. During the course of performance of the Contract, the Contractor may seek approval from the IDOT District EEO Officer to employ additional eligible TPG trainees. In the event the Contractor subcontracts a portion of the contracted work, it must determine how many, if any, of the TPGs will be trained by the subcontractor. Though a subcontractor may conduct training, the Contractor retains the responsibility for meeting all requirements imposed by this Special Provision. The Contractor must also include this Special Provision in any subcontract where payment for contracted work performed by a TPG trainee will be passed on to a subcontractor.

Training through the Program is intended to move TPGs toward journeyman status, which is the primary objective of this Special Provision. Accordingly, the Contractor must make every effort to enroll TPG trainees by recruitment through the Program participant educational institutions to the extent eligible TPGs are available within a reasonable geographic area of the project. The Contractor is responsible for demonstrating, through documentation, the recruitment efforts it has undertaken prior to the determination by IDOT whether the Contractor is in compliance with this Special Provision, and therefore, entitled to the Training Program Graduate reimbursement of \$15.00 per hour.

Notwithstanding the on-the-job training requirement of this TPG Special Provision, some minimal off-site training is permissible as long as the offsite training is an integral part of the work of the contract, and does not compromise or conflict with the required on-site training that is central to the purpose of the Program. No individual may be employed as a TPG trainee in any work classification in which he/she has previously successfully completed a training program leading to journeyman status in any trade, or in which he/she has worked at a journeyman level or higher.

INSURANCE

All references to Sections or Articles in this specification shall be construed to mean specific Section or Article of the Standard Specifications for Road and Bridge Construction, adopted by the Department of Transportation.

The Contractor shall name the following entities as additional insured under the Contractor's

general liability insurance policy in accordance with Article 107.27:

City of Springfield

The entities listed above and their officers, employees, and agents shall be indemnified and held harmless in accordance with Article 107.26.

MAINTENANCE MOWING

Description: This work shall consist of mowing vegetated rights of way, easements and excess parcels as directed by the Engineer to maintain the project site in compliance with the City of Springfield's nuisance ordinance throughout the duration of the contract.

General: The Engineer shall notify the Contractor in writing when mowing is required. The notice will include delineation of areas to be mowed on scalable drawings or on parcel maps with parcels of known acreage. Mowing shall be performed in accordance with Section 250.06(b) except that mowing of slopes as great as 1:2 (V:H) will be required. Mowing shall be completed within 10 days of the written notification.

Method of Measurement: Mowing will be measured in acres with areas computed from plan drawings or known parcel acreages.

Basis of Payment: Each satisfactorily completed mowing notification will be paid for at the contract unit price per acre for MAINTENANCE MOWING. Only the initial mowing for each notification will be paid for. Any subsequent mowing required to obtain a height of not more than 3 in. or to disperse mowed material will be considered as included in the cost of the initial mowing.

MANHOLES

Manholes shall be in accordance with Section 602 of the Standard Specifications except that those noted on the plans as sanitary manholes shall have the additional requirements noted below. Manholes shall be precast reinforced concrete. All joints shall be made with an approved bitumastic material on an approved rubber gasket. The completed manhole shall be watertight.

Where shown on the plans, drop connections shall be constructed in accordance with drawing No. 6 in the Standard Specifications for Water and Sewer Main Construction. Cost for drop connections shall be included in the contract unit price for manholes of the size and type specified.

Manhole steps, when required, shall be gray cast iron ASTM A48 or polypropylene coated steel reinforcing rods with load and pullout ratings meeting OSHA standards.

Channels shall be made to conform in shape and slope to that of the connecting sewers and shall be brought together smoothly with well-rounded junctions, satisfactory to the ENGINEER, and

in conformance with details shown on the plans.

All manholes shall be tested by the Contractor for watertightness by either of the following methods in conformance with the requirements specified:

- A. ASTM C969: “Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines.”
- B. ASTM C 1244: Standard Test Method for Concrete Sewer Manholes by the Negative Pressure (Vacuum) Test.”

For new manholes located at S. Grand Avenue and Cook Street, the manholes will be paid for the size and type specified, which price shall include the precast structures, gaskets, concrete fill, risers, cones or flat top slabs, frames and lids, steps, sand cushion, concrete trough, and all excavation and backfilling. The unit price per each for the size and type specified shall also include any connection to existing or proposed sewers, temporary shoring, excavation and backfill to complete the connection, the removal of existing storm sewer, if necessary, and staging and temporary construction to maintain flow during construction.

The temporary soil retention systems at each manhole (except manholes, special and manhole type A, 9’ diameter) will be according to Section 522 of the IDOT SSRBC and payment for these systems will be included in the unit price each for the size and type of manhole specified.

The unit price per each for the size and type specified shall also include any connection to existing or proposed sewers, temporary shoring, excavation and backfill to complete the connection, the removal of existing storm sewer, if necessary, and staging and temporary construction to maintain flow during construction.

This work will be paid for at the contract unit price per each for MANHOLES of the type and size specified.

MANHOLE, SPECIAL

Description: This work shall consist of constructing manholes as shown in the plans in accordance with Section 602 of the SSRBC with exceptions shown on the Plans and as specified herein.

Materials: Manhole Pipe Gaskets: Flexible pipe to manhole connectors shall be installed to create a watertight seal between the pip and the manhole. Connectors shall be A-Lok, Kor-N-Seal or Press-Seal type cast in the structure. Each shall be specifically designed for the size and type of piping installed.

Precast concrete base, if used, and top slab shall be according to section 1042 of the SSRBC except that shop drawings according to Article 1042.03(b) will be required, and concrete shall have a minimum compressive strength of 5000 psi at twenty-eight (28) days.

Construction Requirements: Temporary soil retention system shall be furnished and installed in accordance with Section 522 of the SSRBC based on field verified location of existing storm

sewers.

The existing 48 in. and 54 in. diameter concrete and/or brick sewer are combined sewers that carries waste water as well as storm water. Blockage of the sewer may result in wide spread property damage during a large storm event. Low flow is primarily waste water and shall be conveyed in temporary piping through the manhole excavation. The contractor shall make all necessary provisions to maintain both storm and sanitary flow through the project area.

Existing brick sewer shall be maintained on temporary supports during construction of cast-in-place manhole base. The Contractor shall place concrete collars around the existing sewer prior to removing any brick.

Flexible pipe to manhole connectors shall be provided at all manhole penetrations. The connectors shall be sized specifically for the type of pipe being used. Connector and connecting pipe installation shall be according to the recommendations of the connector manufacturer.

Connections to existing storm sewer shall be completed by constructing a concrete collar around the circumference of the existing brick sewer.

Following installation of all pipes, concrete troughs shall be constructed in the bottom of the manhole to ensure laminar flow through the structure.

All manholes shall be tested by the Contractor for watertightness by either of the following methods in conformance with the requirements specified:

- A. ASTM C969: "Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines."
- B. ASTM C 1244: "Standard Test Method for Concrete Sewer Manholes by the Negative Pressure (Vacuum) Test."

Basis of Payment: This work will be paid for at the contract unit price per each for MANHOLE, SPECIAL, which price shall include the cast-in-place concrete structure, collars, existing pipe removal, reinforcement, gaskets, concrete fill, risers, cones, frames and lids, steps, sand cushion, concrete trough, plugging existing pipe opening, and all excavation and backfilling. The unit price per each for MANHOLE, SPECIAL shall also include removal and disposal of existing manhole and storm sewer as required for manhole construction and connection to existing sewers, construction of new storm sewer to connect existing storm sewer to the manhole, and staging and temporary construction and bypass pumping to maintain flow during construction.

The temporary soil retention system will be paid for according to Section 522 of the SSRBC.

MANHOLE, TYPE A, 9' DIAMETER, TYPE 1, FRAME, CLOSED LID (SPECIAL)

Description: This work shall consist of constructing sanitary manholes as shown in the plans in accordance with Section 602 of the SSRBC with exceptions shown on the Plans and as specified herein.

Materials: Manhole Pipe Gaskets: Flexible pipe to manhole connectors shall be installed to create a watertight seal between the pipe and the manhole. Connectors shall be A-Lok, Kor-N-Seal or Press-Seal type cast in the structure. Each shall be specifically designed for the size and type of pipe being installed.

Precast concrete base, if used, and top slab shall be according to Section 1042 of the SSRBC except that concrete shall have a minimum compressive strength of 5000 psi at twenty-eight (28) days.

Construction Requirements: Temporary soil retention system shall be furnished and installed in accordance with Section 522 of the SSRBC based on field verified location of existing sewers. The existing sewer is a combined sewer that carries waste water as well as storm water and is constructed of brick or concrete. Blockage of the sewer may result in widespread property damage during a large storm event. Low flow is primarily waste water and shall be conveyed in temporary piping through the manhole excavation. The contractor shall make all necessary provisions to maintain both storm and sanitary flow through the project area.

Existing sewer shall be maintained on temporary supports during construction of cast-in-place manhole base. The contractor has the option of constructing a precast manhole base in accordance with Article 602.07 of the SSRBC except that the cushion shall be 8 in. thick well compacted course aggregate for backfill, bedding, and trench backfill for pipe culverts and storm sewers according to Article 1004.05.

Flexible pipe to manhole connectors shall be provided at all manhole penetrations. The connectors shall be sized specifically for the type of pipe being used. Connector and connecting pipe installation shall be according to the recommendations of the connector manufacturer.

Connections to existing storm sewer shall be completed by constructing a reinforced concrete collar 8 in. thick around the full circumference at the connect to the existing pipe.

Following installation of all pipes, concrete troughs shall be constructed in the bottom of the manhole to ensure laminar flow through the structure.

All manholes shall be tested by the Contractor for watertightness by either of the following methods in conformance with the requirements specified:

- A. ASTM C969: "Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines."
- B. ASTM C 1244: "Standard Test Method for Concrete Sewer Manholes by the Negative Pressure (Vacuum) Test."

Basis of Payment: This work will be paid for at the contract unit price per each for MANHOLE, TYPE A, 9' DIAMETER, TYPE, FRAME, CLOSED LID (SPECIAL), which price shall include the cast-in-place or precast structures, reinforcement, gaskets, concrete fill, risers, cones or flat slab tops, frames and lids, steps, sand cushion, concrete trough, and backfilling. The unit price per each shall also include removal and disposal of existing storm sewer as required for manhole construction and connection to existing sewers, construction of new sewer to connect existing sewer to the manhole, excavation and backfill to complete the connection, and staging and temporary construction and bypass pumping to maintain flow during construction. The

temporary soil retention system will be paid for according to Section 552 of the SSRBC.

The temporary soil retention system will be paid for according to Section 522 of the SSRBC.

ORNAMENTAL FENCE

Description: This work shall consist of all labor, material and equipment necessary for the installation of ornamental fence at locations shown on the plans and as detailed in the plans. The Contractor shall submit shop drawings showing fence member sizes, member layout, connections, materials and finishes. Submit structural design calculations.

The Contractor shall warranty for a period of one year against failure of assembly and installation. The fence shall have a twenty-year manufacturer's warranty against product failure.

Fence shall be designed for a 90 mph (3-second gust) in accordance to ASCE 7-05. Wind load on an iced fence to be designed using a wind speed of 40 mph (3-second gust). Design fence for wind exposure Category C. Wind Exposure Category C is defined as open terrain with scattered obstructions having heights generally less than 30 feet. This category includes flat open country with grasslands.

The fence shall also be designed to resist a single concentrated load of 200 pounds applied in any direction at any point on the top rail. The fence shall also be designed to resist a load of 50 pounds/foot applied at any direction along the top rail. This load need not be applied at the same time as the 200-pound concentrated load.

The fence shall include:

1. The fence and posts shall be galvanized steel with factory finish in accordance with the manufacturer's specifications. Color to be black. Hardware for attachments shall also be galvanized.
2. Hardware for an attachment of fence post to concrete surface to be in accordance with details as shown on the plans and to include:
 - i. 7½" x 6" x ½" thick A36 steel plate, drilled for anchor bolt holes, to be welded to fence post at point of fence post manufacture. Weld shall be made smooth and flush and shall be in accordance with the AWS Welding code. Weld to be applied prior to galvanizing. The steel plate shall receive the same galvanizing as the fence components.
 - ii. Anchor bolts shall be as shown on the plans.

Fence installation:

1. The fence shall be installed on the proposed slope wall at locations shown on the plans and as directed by the Engineer.
2. Posts shall be set plumb. Fence sections shall be securely fastened to posts according

to manufacturer's recommendations, taking care to protect the posts and fence from scuffing and other damage.

3. Welding of fence material in the field shall not be performed.
4. Any damage to product or site will be repaired or replaced to the satisfaction of the engineer.
5. Fence shall be cleaned to the satisfaction of the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price per foot for ORNAMENTAL FENCE which price shall include all labor, material and equipment necessary to properly install the fence as shown on the plans and to the satisfaction of the Engineer.

PAVEMENT REMOVAL

This work shall be in accordance with Section 440 of the Standard Specifications except as follows:

1. Pavement thickness and material type to be removed is not shown on the plans at all locations. Brick pavement removal is included in this work.
2. This work shall include removing asphalt, concrete pavement, brick, aggregate, earth, and curb and gutter at designated locations and for sewer installation along Cook Street and South Grand Avenue. The pavement removal will be to a depth of 18 in. below the surface of the existing pavement and will include all materials within that depth. Any removal required below the 18 in. depth will be paid for as earth excavation. No adjustments will be made for variations in thickness.
3. Paragraph 440.07(c) is deleted.

This work will be paid for at the contract unit price per square yard for PAVEMENT REMOVAL.

PIPE ELBOWS

Pipe elbows shown on the plans will not be measured separately for payment but will be paid for at the contract unit price per foot of the size and type of pipe specified. Elbows will be measured the centerline of the pipe.

PRE-BID SITE INSPECTION OF PUMP STATION

The existing pump stations located at S. Grand Ave. and Cook Street will be open for the Contractor's inspection 10 calendar days prior to bid opening. A representative of the City of Springfield will be on hand on this date.

PRECAST CONCRETE PARKING BLOCK

Parking blocks shall be air entrained (5%-7%) precast reinforced concrete 4,000 PSI minimum strength, length 6 ft, height 5 in. width 9 in. with pin holes and 2 to 4 reinforcement bars. Base should be raised to allow for drainage. Parking blocks shall be yellow.

This work, including furnishing and installing parking blocks with metal pins, will be paid for at the contract unit price each for PRECAST CONCRETE PARKING BLOCKS.

PUMP STATION ELECTRICAL WORK

General: The work to be included under this item shall be the furnishing, installing, and testing of all materials and electrical equipment necessary in order to provide a complete and operational electrical system at the Pump Station.

Pump Station Electrical Work, No. 1 refers to the work at Cook Street. Pump Station Electrical Work, No. 2 refers to the work at South Grand Avenue.

The Contractor shall furnish and install all materials necessary for a complete and operational installation of the electrical equipment. The complete installation and wiring shall be done in a neat, workmanlike manner. All electrical work shall comply with the requirements of NFPA 70 – National Electrical Code (NEC), most current issue in force, and all other applicable local codes, laws, ordinances, and requirements in force. Electrical equipment shall be installed in conformance with the respective manufacturer's directions and recommendations for the respective application. Any installations which void the UL listing, FM Approval, ETL listing (or other third party listing), and/or the manufacturer's warranty of a device will NOT be permitted.

The electrical work and equipment specified is based on equipment of the type and size as noted on the Plans and specified herein. Should the proposed pump motors (or any other proposed loads) exceed the ratings of the electrical equipment specified, the General Contractor shall be solely responsible for furnishing any and all modifications necessary in order to provide a fully functional system to the satisfaction of the Engineer at no change to the contract cost. The Contractor shall also be required to submit for review, sufficient information determined by the Engineer to be necessary to review such alternates or modifications.

Per Illinois Environmental Protection Agency Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter II: Environmental Protection Agency Part 370: Illinois Recommended Standards for Sewage Works all electrical equipment installed in a sewage pump station wet well shall be suitable for Class I, Division 1, Group D hazardous location. In addition equipment located in a sewage wet well shall be suitable for use under corrosive conditions. All electrical installations associated with a sewage pump station shall conform to the applicable sections of NEC 500, 501, and 504 in addition to the other applicable sections of NEC. Where electrical equipment is installed in a classified hazardous location it shall be UL-listed, Factory Mutual-listed, or ETL-listed suitable for use in the respective classified hazardous location.

Per NFPA 820, Standard for Fire Protection in Wastewater Treatment and Collection Facilities, a wastewater pumping station wet well (with no ventilation or ventilated at less than twelve (12) air changes per hour) is classified as a Class I, Division 1, Group D hazardous location. All electrical installations associated with the pumping station wet well shall conform to the applicable sections of NEC 500, 501, and 504 in addition to the other applicable sections of NEC. Where electrical equipment is installed in a classified hazardous location it shall be UL-listed, Factory Mutual-approved, or ETL-listed suitable for use in the respective classified hazardous location.

All work, power outages, and/or shut down of existing systems shall be coordinated with the respective facility owner's representative. Once shut down, the circuits shall be labeled as such to prevent accidental energizing of the respective circuits. All personnel shall follow U.S. Department of Labor Occupational Safety & Health Administration (OSHA) 29 CFR Part 1910 Occupational Safety & Health Standards for electrical safety and lockout/tagout procedures, including, but not limited to, 29 CFR Section 1910.147 the control of hazardous energy (lockout/tagout).

Contractor shall keep a copy of the latest National Electrical Code in force on site at all times during construction for use as a reference.

Contractor and respective electrical contractor shall keep a set of construction plans and specifications with all addenda and copies of any applicable change orders on site at all times.

Submittals: Contractor shall provide shop drawings for all electrical equipment. Shop drawings shall clearly indicate proposed items, capacities, characteristics and details in conformance with the Plans and Specifications. The respective manufacturer shall certify capacities, dimensions, special features, etc. Shop Drawings for all items shall be prepared immediately upon award of Contract. The Contractor shall submit a minimum of four (4) copies to be retained by the Engineer plus the number of copies, for which the Contractor requires distribution. No materials shown thereon shall be ordered until Shop Drawings are reviewed and approved by the Engineer. When a submittal is marked "Revise and Resubmit," "Rejected," and/or "Submit Specified Item" do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations, resubmit, and repeat if necessary to obtain a different action mark such as "No Exceptions Taken" or "Furnish as Corrected". Contractor is responsible for compliance with the specified characteristics. Contractor's responsibility for error and omissions in submittals is not relieved by the Engineer's review of submittals. Accompany each submittal with a transmittal letter that includes the date, project title and number, Contractor's name and address, the number of shop drawings, product data, and/or samples submitted, notification of any deviations from the Contract, and any other pertinent data. Shop drawing submittals shall include the following:

- A. Date and revision dates.
- B. Project title and number(s).
- C. Identification of product or material.

- D. Certified outline and installation drawings.
- E. Performance data and operating characteristics.
- F. Arrangement drawings showing piping, controls and accessory equipment.
- G. Drawings on non-standard components and accessories.
- H. Catalog data marked to indicate materials being furnished.
- I. Operation and Maintenance/Instruction Manuals.
- J. Specified standards, such as ASTM numbers, ANSI numbers, UL listing/standard, NEMA ratings, etc.
- K. A blank space, 3 in. x 5 in., for Architect/Engineer's stamp.
- L. Identification of previously approved deviation(s) from Contract documents.
- M. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements and compliance with Contract documents.
- N. Space for Prime Contractor's approval stamp.

EQUIPMENT AND MATERIALS

Conduit and Fittings

Comply with IDOT Standard Specifications and the following.

Galvanized Rigid Steel Conduit: Rigid Steel Conduit and fittings shall be hot-dipped, galvanized, UL-listed, and produced in accordance with UL Standard 6 – Rigid Metal Conduit and ANSI C80.1 – Rigid Steel Conduit, Zinc Coated. Couplings, connectors, and fittings for rigid steel conduit shall be threaded, galvanized steel or galvanized, malleable iron, specifically designed and manufactured for the purpose. Fittings shall conform to ANSI C80.4 – Fittings Rigid Metal Conduit and EMT and UL 514B – Conduit, Tubing, and Cable Fittings. Set screw type fittings are not acceptable.

Schedule 40 PVC and Schedule 80 PVC Conduit: Conduit shall be Schedule 40 PVC or Schedule 80, 90 C, UL-rated. Material shall comply with NEMA Specification TC-2 (Conduit), TC-3 (Fittings-UL-514), and UL-651 (Standard for rigid nonmetallic conduit). The conduit and fittings shall carry a UL label (on each 10 ft length of conduit and stamped or molded on every fitting). Conduit and fittings shall be identified for type and manufacturer and shall be traceable to location of plant and date manufactured. The markings shall be legible and permanent. The conduit shall be made from polyvinyl chloride C- 300 compound

which includes inert modifiers to improve weatherability, heat distortion. Clean rework material, generated by the manufacturer's own conduit production, may be used by the same manufacturer, provided the end products meet the requirements of this Specification. The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes, or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections which could mar conductors or cables. Conduit, fittings and cement shall be produced by the same manufacturer to assure system integrity and shall be Carlon Plus 40, Plus 80 conduit, or approved equal.

Rigid Aluminum Conduit: Rigid Aluminum conduit shall be heavy wall type fabricated from 6063 aluminum alloy, T-1 temper, (former designation T-42). Aluminum rigid conduit shall comply with Underwriter's Laboratories UL-6, latest revision, and American National Standards Institute (ANSI) C80.5 – Rigid Aluminum Conduit.

PVC Coated Rigid Aluminum Conduit: PVC coated rigid aluminum conduit and fittings shall be as manufactured by Robroy Industries, Inc., Thomas & Betts or Plasti-Bond. The conduit, prior to coating, shall be new, unused material and shall conform to UL 6, Standard for Safety for Rigid Metal Conduit. An exterior gray PVC coating of a nominal 40 mils, (.040 in.), shall be applied to the conduit and conduit couplings. The PVC coating shall conform to all applicable requirements of NEMA RN-1, Standard for PVC Coated Conduit. An interior red polyurethane coating of 2 mils (.002 in.), shall be applied to the conduit and conduit couplings. The polyurethane coating shall conform to all applicable requirements of NEMA RN- 1, Standard for PVC Coated Conduit. Conduit having areas of thin or no coating shall be unacceptable. The PVC and polyurethane coatings applied to conduit shall have sufficient flexibility to permit field bending without cracking or flaking at temperatures above 30 degrees F (-1 degrees C). All male threads on conduit and all female threads on conduit couplings shall be protected by a coat of red polyurethane.

PVC-Coated, Galvanized, Rigid Steel Conduit: PVC-coated, galvanized, rigid steel conduit shall be manufactured by Robroy Industries, Inc., Thomas & Betts or Plasti-Bond PVC coating shall be a minimum of 40 Mils permanently fused to hot dipped, galvanized, rigid steel conduit. An interior red polyurethane coating of 2 mils (.002 in.), shall be applied to the conduit and conduit couplings.

Explosion-Proof Flexible Conduit (where applicable): Explosion-proof, flexible conduit shall be suitable for use in Class I, Division 1, Group D hazardous locations, and liquid-tight for wet locations. Conduit shall have an interior insulating liner to protect conductors from abrasion under vibrating conditions. Conduit shall provide a continuous electrical path. Explosion-proof, flexible conduit shall be Crouse-Hinds, O-Z/Gedney ECGJH, ECLK Series, or Appleton EXGJH or EXLK Series Flexible Coupling.

Explosion-Proof Conduit Seal-Off Fittings: Explosion-proof conduit seals shall be listed suitable for use in Class I, Division 1, Group D hazardous location. Explosion-proof conduit seals shall be Crouse-Hinds EYS or EZS Series, Appleton EYS, ESU, or EY Series, or O-Z/Gedney EYA, EY, EZS Series explosion-proof sealing fitting.

Miscellaneous Fittings: Fittings shall be suitable for use with conduits and ducts supplied. All

fittings for use with rigid metal conduit shall be threaded. Set screw type fittings are not acceptable. All conduit bodies, fittings, and boxes installed in classified hazardous locations (Class I, Division 1 or 2, Group D) shall be suitable for use in Class I, Division 1, Group D locations. Fittings shall be as manufactured by Appleton, Crouse-Hinds, Hubbel-Killark, or O- Z/Gedney.

Conductors

XHHW Wire: Cable shall be UL-listed as Type XHHW-2 per UL Standard 44 for Rubber-Insulated wires and cables. Cable shall also conform to ICEA S-95-658/NEMA WC70 and Federal Specification J-C-30B. Conductors shall be Class B stranded annealed uncoated copper per UL Standard 44. Insulation shall be rated for 600-Volt. Insulation shall be cross-linked polyethylene complying with the physical and electrical requirements of UL Standard 44 for Type XHHW-2. Service conductors shall be Service Wire, Encore Wire or General Cable Type XHHW-2.

THWN Wire: Cable shall be 1/C sized as indicated on the Plans. Cable shall comply with Underwriters' Laboratories Standard UL-83 and shall be UL-listed as VW-1. Conductor shall be soft annealed uncoated copper and shall comply with ASTM B3 and B8. Insulation shall be rated for 600-Volt. Insulation shall be polyvinyl-chloride conforming to Underwriters' Laboratories requirements for Type THW. The outer covering shall be nylon conforming to Underwriters' Laboratories for type THHN or THWN-2. Cable shall be UL-listed and marked THWN. Power and control wiring shall be Southwire, Encore Wire or General Cable Type THWN-2.

Supporting Devices

Strut supports for exterior applications shall be 304 stainless steel strut support 1 5/8 in. x 1 5/8 in. 12 gauge thickness with 9/16 in. slot at 2 in. spacing. Strut support for equipment located in the wet well, valve vault, or other corrosive areas shall be stainless steel or reinforced fiberglass material as manufactured by Unistrut, B-Line, or Aickinstruct. Provide necessary hardware, such as floor flanges, etc., as required to install equipment as specified and as shown on the Plans. All hardware shall be stainless steel.

Provide materials, sizes and types of anchors, fasteners, and supports necessary to carry the loads of equipment and conduits. Consider weights of conduit when selecting products.

Fasteners and anchors shall be corrosion resistant, stainless steel. Where suitable, nonmetallic clamps and fasteners may be used.

Cable hangers shall be heavy duty nylon saddle rack with 3 in. throat opening Underground devices. Cable hangers shall be adequately sized to accommodate the respective cables. Secure cables to cable hangers with corrosion resistant cable ties.

Circuit Breakers

Circuit breakers for feeder circuits shall be thermal magnetic, molded case, 250-Amp frame minimum, 18,000 Amps symmetrical minimum, interrupting current rating at 480 VAC for three-pole breakers. Cutler-Hammer, Square D or GE. Alternate products will be allowed but must meet this specification and be approved by the Engineer. Breakers shall have “on”, “off” and “tripped” positions and shall be UL-listed. Breakers shall be sized as required for the respective equipment in accordance with NEC and the respective equipment manufacturer’s recommendation. Enclosure shall be NEMA 4X stainless steel with a hinged door and be pad lockable in the off position. Include a separate ground lug. Cutler-Hammer, Square D or GE. Alternate products must be approved by the Engineer.

CONSTRUCTION METHODS

Temporary Power: The Contractor shall make necessary arrangements and provide all temporary electric service and lighting required during entire construction period including required fees and permits. Cost of electricity used shall be borne by the Contractor. The temporary service shall comply fully with all NEC and OSHA requirements for temporary service.

Electric services shall be of sufficient capacity and characteristics to supply proper current for various types of construction tools, motors, welding machines, lights, heating plant, ventilation system, pumps and other work required. All necessary temporary wiring, panelboard, outlets, switches, lamps, fuses, controls and accessories shall be provided by the Contractor. All 120 VAC, 15-Amp and 20-Amp receptacles shall be ground fault circuit interrupter type.

Materials used for temporary service shall not be used in permanent system unless specific approval is given by the Engineer. Temporary service shall be so constructed and arranged as not to interfere with progress of other trades. This systems shall be erected and maintained strictly in accordance with all ordinances and requirements for temporary service pertaining thereto inclusive of OSHA and NEC, (most current issue in force).

The serving electric utility company for the work site is as follows: City Water Light and Power (CWLP)

401 N. 11th Street Springfield, IL (217) 321-1354

The Contractor who has installed a temporary utility connection as herein specified, shall, prior to final acceptance, remove temporary connections and installations and leave premises restored to condition in which it was found.

Electric Service Entrance: Contractor shall furnish and install electric service entrance as detailed on the Plans and specified herein. As part of the service entrance work, the Contractor shall coordinate with the serving utility:

- A. The installation of a 480 VAC, three (3)-phase, three (3)-wire service sufficient to handle the loads of the respective pump station and associated equipment located at the site. The Contractor shall coordinate the new electric service

with the serving electric utility company. The service entrance shall include, but not be limited to, all service entrance equipment, labor and materials as detailed on the Plans and specified herein, in order to provide a complete and operational electrical system.

B. City Water Light and Power (CWLP): Major work items to be performed by CWLP (not in contract) shall be as follows:

1. Removal and replacement of existing utility pole, transformers, and electric meter.
2. The furnishing of power for a 480 VAC, three (3)-phase, three (3)-wire secondary service sufficient to handle the loads for a 225-Amp service.
3. Shall furnish & connect the service entrance conductors from the primary line location to the pad mounted transformer.
4. Shall furnish and install the meter base and meter.
5. Shall furnish and install grounding electrode for service entrance ground system.
6. CWLP shall retain the right to review and approve drawings prior to installation.

C. Contractor: Major work items to be performed by the Contractor (in Contract) shall be as follows: (all work, labor, equipment, and materials shall be as detailed on the Plans specified herein, and per the serving electric utility's requirements, where applicable).

1. Verifying all requirements with serving electric utility.
2. Coordinating the electric service entrance work and billing arrangements with the serving electric utility company.
3. Additional work as required by the serving electric utility and as required to provide a complete and operational electric service entrance system.
4. Extend service conduit and conductors from the secondary of the service transformer to the pump control panel service disconnect switch.
5. Coordinate a second utility service to serve the new lighting system and controller.

Installation of Conduits

- A. Comply with IDOT Standard Specifications and the following.
- B. All exterior above grade exposed conduit shall be PVC Coated galvanized rigid steel (GRSC) or PVC coated rigid aluminum as detailed on the Plans.
- C. All work shall be laid out with sleeves for openings through slabs, pump station

or valve vault walls, etc. as required. If sleeves and inserts are not properly installed, the Contractor will be required to do all necessary cutting and patching to accommodate conduits.

- D. Conduit size and fill requirements shall comply with Chapter 9 and Annex C of the NEC. It should be noted these are minimum requirements and larger conduit sizes or smaller fill requirements shall be used whenever specified or detailed on the Plans.
- E. Ream conduits only after threads are cut. Cut joints square to butt solidly into couplings. Where necessary to join two pieces of conduit and it is impossible to use standard coupling, use three (3)-piece malleable iron conduit coupling. The use of running thread is prohibited. This applies to all rigid conduit installations, underground or otherwise.
- F. Make all joints in steel underground conduit water-tight with approved joint compound. Temporarily plug conduit openings to exclude water, concrete or any foreign materials during construction. Clean conduit runs before pulling in conductors.
- G. Hickey bends will not be acceptable for conduits 1-in. and larger. Use manufactured elbows or bends fabricated with bending machine. Field bending of all PVC conduit shall be accomplished with the use of equipment approved by the conduit manufacturer. Open flame bending equipment will not be acceptable.
- H. A run of conduit between a junction box, pull box, and/or fitting shall not contain more than the equivalent of four (4) quarter bends, including bends immediately at the respective box or fitting.
- I. Where conduits enter a box or fitting, provide a steel locknut and an insulated metallic bushing. Use this method to terminate conduit in panels, pull boxes, safety switches, etc. Conduit terminations in service equipment shall have grounding bushings with ground wire connections between the bushing and the ground bus.
- J. Run exposed conduits parallel with respective walls or supporting structure and at right angles to the respective building, vault, etc., not diagonally. Make bends and turns with pull boxes or hot-dipped galvanized malleable iron fittings and covers.
- K. Conduit terminations shall include bushings to protect cables and wires from damage from conduit.
- L. Set screw type fittings are prohibited.
- M. Use only screws, bolts, washers, etc. fabricated from rust resisting metals for the supporting of boxes.

- N. Schedule 40 PVC conduit and/or sleeves shall be used for grounding electrode conductors.
- O. Metal conduit in direct contact with earth or concrete shall be PVC-coated GRSC or PVC coated rigid aluminum conduit.
- P. Per Illinois Environmental Protection Agency Title 35: Environmental Protection, Subtitle C: Water Pollution, Chapter II: Environmental Protection Agency Part 370: Illinois Recommended Standards for Sewage Works all electrical equipment installed in a sewage pump station wet well shall be suitable for Class I, Division 1, Group D hazardous location. In addition equipment located in a sewage wet well shall be suitable for use under corrosive conditions. All electrical installations associated with a sewage pump station shall conform to the applicable sections of NEC 500, 501, and 504 in addition to the other applicable sections of NEC. Where electrical equipment is installed in a classified hazardous location it shall be UL-listed, Factory Mutual-listed, or ETL-listed suitable for use in the respective classified hazardous location.
- Q. Perform all work in classified hazardous locations as defined by the NEC in strict accordance with the NEC for the particular "Class", "Division", and "Group" of hazardous locations involved or indicated on the drawings. Provide conduit and cable seals in accordance with the NEC.
- R. All conduits installed in classified hazardous locations (including Class I, Division 1 or 2, Group D) shall be suitable for the respective location. All boxes and fittings installed in Class I, Division 1 locations shall be approved (FM approved or UL listed) suitable for Class I, Division 1 locations. All boxes and fittings installed in Class I, Division 2 locations shall conform to the requirements of NEC 501.10 (B)(4).
- S. Per Article 501.15 (C) (6) of the NEC and UL Standard 886, the cross sectional area for conductors installed in a conduit seal off fitting shall not exceed 25 percent, unless the conduit seal off fitting has been specifically approved for a higher percentage of fill.
- T. Install explosion proof conduit sealing fittings in conformance with the respective manufacturer's instructions. Contact the respective seal off manufacturer if assistance is required for direction of installing packing fiber to form a dam and pouring the sealing compound.
- U. All conduits between the sewage pump station wet well and control panel shall be PVC coated rigid aluminum. No substitutions.
- V. Aluminum rigid conduit may be used for conduits entering the wet well (between the pump control panel and the wet well of the pump station), provided it has corrosion protection (PVC coating) as detailed on the Plans and as specified herein.

- W. Underground conduits shall be minimum 24-in. below finish grade to the top of conduit where located in areas not subject to vehicular traffic. Underground conduits shall be minimum 36-in. below grade where located in areas subject to vehicular traffic. Where shown on the Plans or where required to avoid obstructions and/or interferences with other underground utilities, deeper burial depths may be required.
- X. Conduits shall be kept clean of concrete, dirt, or foreign substances during storage and construction. After conduit installation, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrel shall be at least 12-in. long and have a diameter 1/4 in. less than the inside diameter of the conduit being cleaned. All obstructions in conduits shall be removed prior to pulling wires or final acceptance. Conduits unable to pass mandrel shall be replaced. All unused conduits shall be capped.
- Y. Trench widths shall be held to a minimum.
- Z. Examine all available site utility information in regard to existing utility lines and locate and protect existing lines. Repair all existing utility lines that are damaged by this construction.
- AA. All excavations shall be barricaded, lighted (where applicable) and protected during construction.
- AB. Contractor shall backfill all excavations.

Installation of Wire and Cable

- A. Wire and cable shall be installed using accepted industry methods to prevent damage to conductors and insulation. Installation shall comply with all applicable sections of the NEC regarding conduit fill.
- B. No splices shall be permitted in conduit bodies. All splices shall be made in junction boxes provided for that purpose as detailed or required by need.
- C. All conduits shall be swabbed until all moisture and grit is removed before any wires are pulled.
- D. Manufacturers recommended pulling tension shall not be exceeded during conductor installation. Use approved pulling lubricant on long pulls or when pulling No. 4 or larger wire.
- E. Neatly train and lace wiring inside boxes, equipment and panelboards.
- F. Color code conductor insulation for #6 AWG and smaller. Color code conductors with tape or colored insulation for #4 AWG and larger. Where conductors are color coded with tape, they shall be identified (color coded) at all points of access.

Insulated ground wires shall have green colored insulation for all conductor AWG and/or Kcmil to comply with NEC 250.119. Neutral conductors shall have white colored insulation for No. 6 AWG and smaller to meet the requirements of NEC 200.6. Color coding shall be as follows:

480 VAC, THREE-PHASE, 3-WIRE

Phase A – Brown Phase B – Orange Phase C – Yellow Ground – Green

- G. Intrinsically safe wiring shall be with blue colored insulation per ANSI/ISA RP 12.6 and NEC 504.
- H. Splicing 600 volt wire shall be as follows:
1. Wire #8 and smaller, may use one of the following:
 - a) Ideal “wing nut” type insulated connectors.
 - b) Scotchlok R, B, and Y type insulated connectors.
 - c) Thomas and Betts, PT-1, PT-2, and PT-3 insulated connectors.
 2. Wire #6 and larger:
 - a) For straight way connections, use compression connector with rubber shrink type insulating cover.
 - b) For tee cable taps, use compression connector with rubber shrink type insulating cover.
 - c) For taps in cutout cabinets, gutters, and other close locations, use O.Z., Burndy, or PLM fittings, type “PT” cable tape with type “PTC” insulating cover.
 3. Use plastic tape on all uninsulated wire splices manufactured by Scotch, Okonite, Brady Co. or Plymouth.
 4. Splice only in accessible junction or outlet boxes.
- I. Connections and Terminations shall be as follows:
1. Identify each conductor in pump/motor control panels, panelboards, junction or pull boxes, or troughs with a permanent pressure sensitive label with suitable numbers or letters for easy recognition. Identify control wiring at each end and in junction boxes with numeric wire number corresponding to control wiring diagram.
 2. Thoroughly clean wire before installing lugs and connectors.
 3. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

4. Terminate spare conductors with electrical tape and roll up in box. Label spare conductors "SPARE."
- J. Inspect wiring for physical damage and proper connection. All wire and cable shall be tested for continuity and short circuits prior to energizing circuits. Verify proper phasing where applicable.

Installation of Supporting Devices

Install products in conformance with manufacturer's instructions and as detailed on the Plans. Provide anchors, fasteners and supports in accordance with NECA Standard of Installation, and as recommended by the equipment manufacturer for the respective application.

Do not fasten/secure supports to pipes, ducts, mechanical equipment, or conduit. Do not use spring steel clips or clamps. Install surface-mounted cabinets, enclosures and panelboards with a minimum of four (4) anchors. Use spring-lock washers under all nuts. All supports installed in the wet well and/or valve vault shall be corrosion resistant. Install supports with stainless steel hardware.

Concrete work associated with support structures shall conform to Section 1020 PORTLAND CEMENT CONCRETE of the Standard Specifications for Road and Bridge Construction and as detailed on the Plans.

Installation of Separately Mounted Circuit Breaker

Secure circuit breaker to structure as shown on Plans. Provide stainless steel strut to secure electrical equipment. Mounting hardware shall be corrosion resistant stainless steel. Install equipment enclosures plumb.

Provide weather proof, abrasion resistant, legend plates for circuit breaker indicating function of the equipment and/or device being fed.

Bond all enclosures to ground with a ground lug or screw and a ground wire. Install grounding bushings with ground wire connections between the bushing and the ground bus at all metal conduit terminations to the enclosures.

Provide NEMA 4 hubs for all conduit entries into equipment enclosures that are rated NEMA 4X to maintain NEMA 4, 4X rating.

Inspect circuit breakers and manual transfer switch for proper operation, tight and secure connections, and correctness. Adjust as necessary to assure proper operation.

Grounding Requirements

Grounding shall conform to the following as applicable: The Contractor shall furnish and install all grounding shown on the Plans and/or as may be necessary or required to make a complete grounding system as required by the latest National Electrical Code (NFPA 70) in force. The

reliability of the grounding system is dependent on careful, proper installation and choice of materials. Improper preparation of surfaces to be joined to make an electrical path, loose joints, or corrosion can introduce impedance that will seriously impair the ability of the ground path to protect personnel and equipment and to absorb transients that can cause noise in communications circuits. The following functions are particularly important to ensure a reliable ground system:

- A. All products associated with the grounding system shall be UL-listed and labeled.
- B. All bolted or mechanical connections shall be coated with a corrosion preventative compound before joining. Sanchem "NO-OX-ID A Special" compound, Burndy Penetrox E, or Gardner-Bender shall be used. Alternate products will be allowed but must meet this specification and be approved by the Engineer.
- C. Metallic surfaces to be joined shall be prepared by the removal of all non-conductive material, per National Electrical Code Article 250-12.
- D. Metallic raceway fittings shall be made up tight to provide a permanent low impedance path for all circuits. Metal conduit terminations in enclosures shall be bonded to the enclosure with UL-listed fittings suitable for grounding. Provide grounding bushings with bonding jumpers (from bushing to the respective ground connection/enclosure frame) for all metal conduits entering service equipment (meter bases, CT cabinet, service disconnects, service panelboards, main service breaker enclosure, etc.). Provide grounding bushings with bonding jumpers for all metal conduits entering an enclosure through concentric or eccentric knockouts that are punched or otherwise formed so as to impair the electrical connection to ground. Standard locknuts or bushings shall not be the sole means for bonding where a conduit enters an enclosure through a concentric or eccentric knockout.
- E. Furnish and install ground fields, and or ground rods at all locations where shown on the Plans or specified herein. Ground rods for electrical installations shall be 3/4 in. diameter by 10 ft long, UL-listed, copper clad with 10 mil. minimum copper coating. Top of ground rods shall be a minimum of 30 in. below finish grade unless otherwise noted on the Plans. Ground rods shall be spaced as detailed on the Plans and in no case spaced less than one (1) rod length apart. All connections to ground rods and/or ground fields shall be made with exothermic weld type connectors, shall be Cadweld by Erico Products, Inc., Thermoweld or Burndy. Exothermic weld connections shall be installed in conformance with the respective manufacturer's directions using molds as required for each respective application. Bolted connections will not be permitted at ground rods or at buried grounding electrode conductors. Grounding electrode conductors shall be bare stranded copper sized as detailed on the Plans. In addition to the grounding work described herein and shown on the Plans, the Contractor shall test the made electrode ground field with an instrument specifically designed for testing ground field systems. If ground resistance exceeds 10 Ohms, contact the Engineer for further direction. Copies of ground field test results shall be

furnished to the Engineer, upon request, for review and record purposes.

- F. All connections, located above grade, between the different types of grounding conductors shall be made using UL-listed double compression crimp-type connectors or UL-listed bolted ground connectors. For ground connections to enclosures, cases and frames of electrical equipment not supplied with ground lugs the Contractor shall drill required holes for mounting a bolted ground connector. All bolted ground connectors shall be Burndy, Thomas and Betts, or Erico. Tighten connections to comply with tightening torques in UL Standard 486A to assure permanent and effective grounding.
- G. All metal equipment enclosures, conduits, cabinets, boxes, receptacles, motors, etc. shall be bonded to the respective grounding system.
- H. Each feeder circuit and/or branch circuit shall include an equipment ground wire. The equipment ground wire shall not be smaller than allowed by NEC Table 250-122 "Minimum Size Conductors or Grounding Raceway and Equipment." When conductors are adjusted in size to compensate for voltage drop, equipment-grounding conductors shall be adjusted proportionately according to circular mil area. All equipment ground wires shall be copper either bare or insulated green in color. Where the equipment grounding conductors are insulated, they shall be identified by the color green and shall be the same insulation type as the phase conductors.
 - 1. Provide all boxes for outlets, switches, circuit breakers, etc. with grounding screws. Provide all control panel, transfer switch, etc. enclosures with grounding bars with individual screws, lugs, clamps, etc. for each of the grounding conductors that enter the respective enclosures. Do not terminate more than one (1) ground wire in ground lug or terminal unless the respective lug or terminal is rated for multiple conductors.
- I. Equipment ground wires shall be identified with green colored insulation for all conductors AWG or Kcmil. Green tape shall not meet this requirement.
- J. All utility transformer bank grounds shall be installed in accordance with the serving utility company's recommendation and in accordance with NEC.
- K. Bond the main electrical service neutral to ground at the main service disconnect. Bond the service neutral to ground at one (1) location only per the National Electrical Code. A grounding connection shall not be made to any neutral circuit conductor on the load side of the service disconnecting means, except as permitted by NEC 250-24.
- L. All exterior metal conduit, where not electrically continuous because of non-metallic junction boxes, etc., shall be bonded to all other metal conduit in the respective duct run, and at each end, with a copper bonding jumper sized in conformance with NEC 250-102. Where metal conduits terminate in an enclosure (such as a motor control center, switchboard, etc.) where there

is not electrical continuity with the conduit and the respective enclosure, provide a bonding jumper from the respective enclosure ground bus to the conduit sized per NEC 250-102.

- M. Install grounding electrode conductors and/or individual ground conductors in Schedule 40 or Schedule 80 PVC conduit. Where grounding electrode conductors or individual ground conductors are run in PVC conduit, Do Not completely encircle conduit with ferrous and/or magnetic materials. Use non-metallic reinforced fiberglass strut support. Where metal conduit clamps are installed, use nylon bolts, nuts, washers and spacers to interrupt a complete metallic path from encircling the conduit.

INSTALLATION AND TESTING OF PUMP CONTROL PANEL

Installation

- A. Control panel shall be installed per manufacturer's recommendations as detailed on the Plans and as specified herein.
- B. All conduit entries into the panel enclosure shall have water-tight threaded hubs, UL-listed for the use with the respective NEMA 4, 4X enclosure to maintain the NEMA 4, 4X rating of the panel enclosure.
- C. Seal conduit openings in the panel enclosure with duct seal.
- D. Conduits with intrinsically safe wiring, including level switch cables, shall terminate in the control panel at the intrinsically safe wiring section. Non-intrinsically safe wiring including, but not limited to, power feeder conductors, branch circuit conductors, and pump motor cables shall not enter the control panel at the intrinsically safe wiring section and shall maintain a minimum separation distance inside the control panel from the intrinsically safe conductors as required by NEC 504 and ANSI/ISA RP12.6.
- E. Install explosion-proof conduit seal-off fittings as detailed on the Plans and in conformance with manufacturer's instructions. Contact the respective conduit seal-off manufacturer if assistance is required for direction of installing the packing fiber to form a dam and pouring the sealing compound.
- F. Install level switches as detailed on the Plans and per manufacturer's directions and recommendations. Verify level elevations with Engineer and Pump Manufacturer's Service Representative and adjust as required. Secure slack level switch cable to cable hangers with corrosion resistant nylon cable ties. Connect equipment ground wires from individual level switches to the respective equipment ground bar in the pump control panel.
- G. Terminate all equipment ground wires on the pump control panel equipment

ground bar. Where pump motor cables include an equipment ground wire and an additional "ground check" wire both ground wires shall be terminated on the equipment ground wire. Where level switch cables include an equipment ground wire terminate the respective ground wire on the control panel equipment ground bar.

Testing

Contractor shall provide services of the pump control panel manufacturer's representative for the purpose of inspection, check-out, testing, start-up, instruction of user personnel, and any other required services to provide a complete and operational system. All tests shall be conducted in the presence of the Engineer. Contractor shall provide water as/if required to test pumps under load. Contractor shall furnish three (3) copies of test results to Engineer. Contractor shall also furnish three (3) copies of Operation and Maintenance Manuals, for operator personnel use, to the Engineer.

Start-up procedure and tests shall include, but not be limited to, the following, as well as other tests and requirements specified herein:

- A. Conduct megger test on each motor, (see Motor Start Up Certification and Testing Report).
- B. Inspect control panel for correct terminal connections and tightness, correct and tighten as required.
- C. Check level switches and corresponding circuitry for proper operation.
- D. Check oil in motors (where applicable).
- E. Check for correct rotation of pump motors, correct as required.
- F. Check for proper pump installation and operation.
- G. Measure voltage at no load (pumps off) and at pumps running under load for each pump motor.
- H. Measure current in each phase with motor running under load for each pump motor.
- I. Verify proper operation of pump motor thermal sensors (where applicable).
- J. Run the pumps in automatic and manual modes of operation. Verify proper operation of alternator.
- K. Simulate alarm conditions and verify proper annunciation of each alarm on the automatic phone dialer system.
- L. Verify a label is provided on the pump control panel with the name, address, phone number, and emergency phone number of the service representative.

- M. Verify proper operation of all pilot lights and alarm lights.
- N. Test receptacles for proper output power and proper operation.
- O. Instruct user personnel about the operation of the control panel and components; indicating items for routine maintenance check, operation modes, failure modes, alarm conditions, etc.
- P. Conduct any additional tests as recommended or required by the manufacturer.
- Q. Correct any defects or deficiencies and retest after corrective and/or repair work has been performed to confirm proper operation of the system.

MARKING AND LABELING

Legend plates shall be provided for all equipment. Legend plates shall be provided to identify the equipment controlled, the power source, and the function of each device. Each individual circuit breaker, control panel, safety switch, shall be furnished with a phenolic engraved legend plate that identifies the respective device, the power source, and the respective voltage, phase, and wire. Furnish additional phenolic engraved legend plates as detailed on the Plans and/or where required by code. Legend plates shall be weatherproof and abrasion resistant phenolic/plastic engraved material and fastened with contact type permanent adhesive, screws, or rivets. Installation shall not break, crack, or deform the legend plate. Lettering shall be 1/4 in. high or larger. Equipment that is powered from a utility power source only (for example the main service disconnect) shall have black lettering on a white background. Equipment that is powered from an emergency source only (for example the generator breaker) shall have black lettering on a yellow background. Equipment that is normally powered from the utility and backed up by portable generator (for example the manual transfer switch) shall have white lettering on a red background.

Furnish and install weatherproof warning label for each meter socket, enclosed circuit breaker, disconnect switch, and control panel to warn persons of potential electric arc flash hazards, per the requirements of NEC 110.16 "Flash Protection." Labels shall also conform to ANSI Z535.4-2002 "American National Standard for Product Safety Signs and Labels." NEC 110.16 requires that switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized shall be field marked to warn qualified persons of potential arc flash hazards. The markings shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment. This new requirement is intended to help reduce the occurrence of serious injury or death due to arcing faults to those working on or near energized electrical equipment. The warning labels are to indicate to a qualified worker who intends to open the equipment for analysis of work that a serious hazard exists and that the worker should follow appropriate work practices and wear appropriate personal protective equipment (PPE) for the specified hazard. Labels shall be as detailed on the Plans or shall include at least the following information: Warning – Potential Arc-Flash Hazards existing while working on this energized equipment. Appropriate PPE Required."

Measurement and Payment: This work will be paid for at the contract lump sum price for PUMP STATION ELECTRICAL WORK, NO. 1 AND PUMP STATION ELECTRICAL WORK, NO. 2 which shall include all labor, equipment, materials, associated supports, hardware, concrete work, tools, operational instructions, utility service work, coordination, and testing required to complete the installation of the pump station and to place it into proper working order. The duplex pump control panel shall be furnished by the respective pump manufacturer's representative and installed by the Electrical Contractor. The furnishing of the duplex pump control panel and pump manufacturer representative's services shall not be included with this item and shall be included in the contract price for PUMPING STATION. The installation of the Duplex Pump Control Panel and all associated electrical work and coordination shall be included with this item.

PUMP STATION MECHANICAL WORK

Description: This work shall consist of the ductile iron piping, fittings, valves, steel pipe supports, and the 2 in. Schedule 40 drain with check valve in the valve vault and Drainage Structures, No. 2.

Pump Station Mechanical Work, No. 1 refers to the work at Cook Street. Pump Station Mechanical Work, No. 2 refers to the work at South Grand Avenue.

Ductile Iron Piping

The ductile iron piping with flanged joints shall conform to ANSI/AWWA C115/A21.15. The pipe shall have a cement mortar lining with asphaltic coating inside and out conforming to ANSI/AWWA A21.4 Gaskets shall be constructed of molded SBR rubber meeting ANSI/AWWA C111/A21.11. Fastening hardware shall be low carbon steel conforming to ASTM A307.

All pressure main fittings shall be flanged joint (FL.) ductile iron, unless otherwise indicated on the Plans. All fittings shall conform to ANSI A21.10 (AWWA C110), or ANSI A21.53 (AWWA C153), where possible. Minimum pressure rating shall be 350 psi. If shown or specified fittings are unavailable in the above standards, the manufacturer's standard may be used upon approval of the ENGINEER. All rubber gaskets shall conform to ANSI A21.11 (AWWA C111). All fittings shall have cement mortar lining and seal coat per ANSI A21.40 (AWWA C104).

Swing Check Valve

Swing check valves shall be flanged with a weighted lever arm and shall be the end product of one manufacturer. The swing check valves shall be installed per the valve manufacturer's instructions.

Swing check valves shall conform to ANSI/AWWA C508, Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) MMS-SP-71 and MMS-SP-80, and ASTM D-1784.

The swing check valve shall utilize a thru-valve disc hinge shaft, with outside lever and weight. The valve shall be designed for either horizontal or vertical installation, as shown on the drawings. The valve shall provide a resilient material to metal seat, and a full waterway design, as defined in AWWA C508.

Swing check valve body shall be ASTM A126 Class B cast iron. The valve body shall be flanged and of one-piece construction and constructed in a globe pattern. The valve outlet flange shall be integrally cast with the valve body and shall be one nominal pipe size larger than the valve inlet flange. Valve body shall be full waterway type, designed to provide a net flow area not less than the nominal inlet pipe size area when swung open no more than 25 degrees. Valve shall have a replaceable bronze body seat. Body seat materials shall be either cast bronze meeting AWWA C508.

Swing check valve shall provide full pipeline flow area with disc at 25 degrees open, and shall allow for 45 degrees total disc rotation. The disc shall be stopped in its full open position by a built-in stop in the valve body. The disc shall be constructed of cast or ductile iron with a minimum strength of 30,000 psi. The disc seat ring (resilient seal) shall be a rubber like material, and shall be selected by the manufacturer in accordance with potable water requirements, as given in AWWA C508. The disc attachment arm shall be constructed of ductile iron or steel with a minimum strength of 65,000 psi. The disc attachment arm shall be prevented from rotation on the disc hinge shaft by a machined keyway and stainless steel key.

The counterweight arm(s) shall be constructed of steel, and shall be secured to the disc hinge shaft by a stainless steel key. The counterweight shall be constructed of cast iron, and shall be secured in position on the counterweight lever by a stainless steel lock screw.

The swing check valve body assembly shall incorporate a circular flanged cover of the same construction as the valve body. The cover shall be of adequate size to permit field inspection, maintenance and replacement of all internal valve components. The valve seat, disc seal ring, and mating surface shall be field removable and replaceable without removing the valve from the pipeline.

The Contractor, in conjunction with the swing check valve manufacturer, shall make adjustments in the position of the lever weight to achieve optimum no-slam operation.

Plug Valves

Plug valves shall be flanged with gear operators and hand wheel, and shall be the end product of one manufacturer. The plug valves shall be installed per the valve manufacturer's instructions. Plug valves shall be of the non-lubricating, eccentric type and shall be designed for a working pressure of 150 psi. Valves shall provide tight shut-off at rated pressure.

The valve shall have a 100 percent port design. The valve body shall be cast iron ASTM A126 Class B with welded in overlay of 99 percent nickel allow content on all surfaces contacting the face of the plug. The valve plug shall be ductile iron ASTM A-536, Grade 65-45-12 with Buna N resilient seating surface to mate with the body seat.

The plug valves shall be furnished with permanently lubricated sleeve type bearings conforming to AWWA C517. Bearings shall be of sintered oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M or bronze ASTM B-127.

Valve shaft seals shall be of the "U" cup type, in accordance with AWWA C517. Seals shall be self-adjusting and re-packable without moving the bonnet from the valve.

Steel Pipe Supports

Steel pipe supports shall be utilized within the valve vault for the fittings, and valves. Pipe supports shall be bolted to the floor of the vault and shall be designed to cradle the diameter of pipe they are supporting.

Valve Vault Drain

2-in. Polyvinyl Chloride (PVC) pipe shall be ASTM D2665 drain, waste, vent pipe. The drain shall be furnished and installed in accordance with Section 20 of the Standard Specifications for Water & Sewer Main Construction in Illinois, as shown on the Plans and as specified herein.

The backfill for the piping shall be controlled low strength material, mix 2 when in the vicinity of the Drainage Structures No. 2 and the valve vault. The Contractor is responsible for any additional fittings required to plumb the drain from the valve vault to the Drainage Structures No. 2.

The annular space around the pipe shall be sealed with non-shrink grout where it penetrates the walls of the valve vault and drainage structure.

The 2-in. check valve shall be a 2-in. ball check with integral unions to connect to the 2 in. drain pipe. The check valve shall be able to be installed in a vertical or horizontal position and still function.

General: This work includes all excavation, labor, materials and equipment required to furnish, and install the ductile iron pipe both flanged and push on, fittings, valves, steel pipe supports, 2-in. Schedule 40 drain pipe, 2-in. check valve, pipe and rail supports, backfilling, accessories, testing, and other incidental items as shown on the plans.

Basis of Payment: This work will be paid for at the contract lump sum price for PUMP STATION MECHANICAL WORK, NO. 1 AND PUMP STATION MECHANICAL WORK, NO. 2.

PUMPING STATION

Pumping station consists of the pumping equipment and accessories and testing as well as the valve vault.

Pumping Station, No. 1 refers to the work at Cook Street. Pumping Station, No. 2 refers to the work at South Grand Avenue.

The valve vault shall be precast reinforced concrete conforming to ASTM C913. A sump pit shall be cast in the base of the valve vault as shown on the plans. The Contractor shall submit plans and calculations for the valve vault that are signed and sealed by a licensed structural engineer in the State of Illinois prior to ordering or manufacturing the valve vault. The structure shall be designed for earth loads and HS-20 live load for vehicle traffic.

Once the vault is installed and piping in place, the space between the valve vault and the limits of excavation shall be backfilled with controlled low strength material, mix 2.

The lid of the valve vault shall be flat and shall be sealed to the top of the valve vault with a double row of butyl mastic. The lid shall have a cast in place aluminum access frame and hatch. The hatch shall be hinged with a flush locking mechanism and a 36-in. by 36-in. minimum clear opening. The top of the hatch shall be a minimum 1/4-in. aluminum diamond tread plate. The access frame and hatch shall be HL93 load rated. Contractor shall coordinate hatch fabrication with the pump manufacturer.

Openings in the structure for pipes shall be sealed water-tight with a flexible resilient type gasket such as A-Lok, Inc., Press Seal, Kor-N-Seal or equal.

After installation is complete, if there are water leaks at joints, the Contractor shall waterproof the leaks using drilled ports around the leak and a hydrophilic grout.

Submersible Pumps and Accessories

Cook Street - Furnish and install two (2) submersible non-clog wastewater pump(s) Model: Flygt N3153.185. Each pump shall be equipped with a 20 HP submersible electric motor 413 “N” Impeller, connected for operation on 480 volts, three (3) phase, 60 hertz, four (4) wire service, with submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The contractor shall determine the length of cable needed with a minimum of 5 ft of additional cable coiled in the wet well. Information associated with the equipment from Flygt was used as the basis for the design as specified herein and shown on the drawings.

South Grand Avenue - Furnish and install two (2) submersible non-clog wastewater pump(s) Model: Flygt N3153.185. Each pump shall be equipped with a 20 HP submersible electric motor 413 “N” Impeller, connected for operation on 480 volts, three (3) phase, 60 hertz, four (4) wire service, with submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The contractor shall determine the length of cable needed with a minimum of 5 ft of additional cable coiled in the wet well. Information associated with the equipment from Flygt was used as the basis for the design as specified herein and shown on the drawings.

Pump Design Configuration

Cook Street - The pumps shall be furnished as one complete pump system, all of the system components supplied by one manufacturer. The pumps shall be vertical, submersible, solids handling type pump, designed to handle gritty sludge and raw stormwater, and shall be capable of passing 3-in. spherical solids. The pump base shall have 8-in. flanged outlet connection. The pump shall be supplied with a mating cast iron 8 in. discharge connection and be capable of delivering 1,555 GPM at 35.2 FT. TDH. A second operating point on the pump curve shall be 1,395 GPM at 38.4 FT. TDH. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. Once installed, there shall be no need for personnel to enter the wet-

well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with a short section of stainless steel lifting chain with a stainless steel guide cable. The working load of the chain section shall be 50 percent greater than the pump unit weight. The pumps shall be supplied with a pump lifting device that follows the guide cable and grabs a section of the chain lead allowing for pump removal. A stainless steel hook rack shall be installed just below the frame and access hatch in Drainage Structures, No. 2 and shall have at least three hooks per pump (min. 6 hooks). Each pump shall conform to Section 101.46 of the IDOT manual with regards to domestically sourced iron and steel products.

South Grand Avenue - The pumps shall be furnished as one complete pump system, all of the system components supplied by one manufacturer. The pumps shall be vertical, submersible, solids handling type pump, designed to handle gritty sludge and raw stormwater, and shall be capable of passing 3-in. spherical solids. The pump base shall have an 8-in flanged outlet connection. The pump shall be supplied with a mating cast iron 8-in discharge connection and be capable of delivering 1,560 GPM at 35 FT. TDH. A second operating point on the pump curve shall be 1,400 GPM at 38.4 FT. TDH. The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with a short section of stainless steel lifting chain with a stainless steel guide cable. The working load of the chain section shall be 50 percent greater than the pump unit weight. The pumps shall be supplied with a pump lifting device that follows the guide cable and grabs a section of the chain lead allowing for pump removal. A stainless steel hook rack shall be installed just below the frame and access hatch in Drainage Structures, No. 2 and shall have at least three hooks per pump (min. 6 hooks). Each pump shall conform to Section 101.46 of the IDOT manual with regards to domestically sourced iron and steel products.

Pump Construction

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be of stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

Cooling System

Each pump motor shall be sufficiently cooled by an internal cooling jacket and submergence in the pumped media.

Cable Entry Seal

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. The grommets shall be compressed by the cable entry unit, thus providing a strain relief function. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered equal.

Motor

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180 degrees C (356 degrees F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95 percent. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel.

The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10 percent. The motor shall be designed for continuous operation in up to a 40 degrees C ambient and shall have a NEMA Class B maximum operating temperature rise of 80 degrees C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 ft or greater.

Power Cable

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the control panel without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 ft or greater.

Bearings

The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a two row angular contact ball bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L₁₀ bearing life shall be 50,000 hours at any usable portion of the pump curve.

Mechanical Seals

Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be

equipped with a float type switch that will signal if the chamber should reach 50 percent capacity.

Pump Shaft

The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be stainless steel – ASTM A479 S43100-T. Shaft sleeves will not be acceptable.

Impeller

The impeller shall be of Hard-Iron™ (ASTM A-532 (Alloy III A) 25 percent chrome cast iron), dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The leading edges of the impeller shall be hardened to Rc 60 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5 percent sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impeller shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

Volute – Suction Cover

The pump volute shall be a single piece grey cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of Hard-Iron™ (ASTM A-532 (Alloy III A) 25 percent chrome cast iron) and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

Protection

Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50 percent chamber capacity, signaling the need to schedule an inspection.

The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

Guide Bracket

Guide rails shall be provided by the general contractor on which the pump rides when being raised or lowered in the sump and mount on the discharge base/elbow. The rails shall align the pump with the discharge elbow as it is lowered into place. An upper rail guide shall be furnished to support and align the rails at the top of the sump. Intermediate guide bracket support shall be provided every 25 ft vertically and shall be coordinated through the pump manufacturer. The guide brackets shall also support the discharge pipe with both the pipe and guide rail supports affixed to the pump station walls.

Guide rails shall be provided on which the pump rides when being raised or lowered in the sump and mounted on the discharge base/elbow. The rails shall align the pump with the discharge elbow as it is lowered into place.

Guide bars shall be stainless steel and the diameter shall be as recommended by the pump manufacturer.

An upper rail guide shall be furnished to support and align the rails at the top of the sump.

The guide rail system shall be non-sparking and approved for use in Class 1, Division 1, Group D hazardous locations.

Installation

The Contractor shall install the pump assemblies in the permanent locations as shown on the drawings and in accordance with the manufacturer's instructions.

Contractor shall install interconnecting electrical wiring, conduit, etc. between submersible pumps and control equipment so that when power and control wiring is brought to the control equipment, the submersible pump system will be a complete operational system.

Testing

The pump manufacturer shall perform the following inspections and tests on the pump before shipment from factory.

1. Impeller motor rating and electrical connections shall first be checked for compliance to the customer's purchase order.
2. A motor and cable insulation test for moisture content or insulation defects.
3. Prior to submergence, the pump shall be run dry to establish correct rotation and mechanical integrity.
4. The pump shall be run for 30 minutes submerged, a minimum of 6 ft under water.
5. After operational test No. 4, the insulation test (No. 2) is to be performed again.
6. Each pump shall be tested for flow versus head at the design conditions in accordance with the latest edition of the Hydraulic Institute Standards.

A written report with certified flow versus head curves stating the foregoing items have been done shall be supplied with the pump at the time of shipment. The curves indicated shall include head, capacity, horsepower, efficiency and input KW.

Prior to system operation, all equipment shall be inspected for proper alignment, quiet operation, proper connection and satisfactory performance by means of a functional test.

Field Testing

Functional Test - required. Performance Test - required.

Before final acceptance of the pumps specified herein, the Contractor shall submit five (5) copies of certified and properly identified performance curves which shall reflect the operating characteristics of each pump model and impeller combination being supplied. The curves shall indicate head, capacity, horsepower, efficiency and input KW.

Manufacturer's Services

The Contractor shall include with his/her bid the services of the equipment manufacturer's field service technician for a period of one (1) trip for a period of two (2) eight (8)-hour days at the site for each pump station. This service shall be for the purpose of check-out, initial start-up, certification, and instruction of plant personnel. A written report covering the technician's findings and installation certification shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

Duplex Pump Control Panel

The pump control manufacturer shall coordinate with the pump supplier to ensure compatibility between the two.

1. General
 - a. The duplex pump control panel enclosure shall be strut support-mounted UL-listed, NEMA 4X stainless steel rated for outdoor use, and pad lockable. Enclosure shall have three (3)-point latching mechanism and handle for easy release. Enclosure shall not have clasps around the door to maintain a NEMA 4 rating. Enclosure shall be sized to accommodate equipment furnished. The enclosure shall also provide for "dead-front" construction using hinged inner doors (swing out panel) to mount all operator devices. Bond all panels and panel doors to ground system. Hinges shall not be considered as an adequate grounding path. All hardware shall be corrosion resistant.
 - b. The panel manufacturer shall be a current Underwriters Laboratories listed UL 508 industrial control panel builder and shall show its follow-up service procedure file number on submittals. The control panel manufacturers shall be regularly engaged in the manufacture of controls for the water/wastewater industry. All devices within the panel shall be UL-listed and/or recognized where applicable and shall be mounted and wired in accordance with the most current edition of UL 508 and the NEC. All conduit runs entering or leaving the pump station wet well shall have explosion-proof conduit seals suitable for Class 1, Division 1, Group D environment. All conduits for intrinsically safe wiring shall enter the pump control panel enclosure at the intrinsically safe section of the panel. Non-intrinsically safe wiring including, but not limited to, power feeder conductors, branch circuit conductors, alarm circuits, and pump motor cables shall not enter the control panel at the intrinsically safe wiring section and shall maintain a minimum separation distance inside the control panel from the intrinsically safe conductors as required by NEC 504 and ANSI/ISA RP12.6.
 - c. All conduit entries into the Pump Control Panel shall have water-tight threaded hubs, UL-listed for the respective NEMA 4X enclosure.
 - d. Include a label placed on the inside of the panel door with the name, address, phone number and emergency phone number of the service representative for the pumps and control panel.

- e. Contractor shall furnish all equipment, labor, services, submittals, tools and work required to provide a complete and operational Duplex Pump Control Panel as shown on the Plans and specified herein.
- f. The pump control panel enclosure shall be located adjacent to proposed pump station as detailed on the Plans. Furnish and install stainless steel strut support Unistrut P1000SS or approved equal, and all mounting hardware. Include warning label on inner and outer door labeled “WARNING POTENTIAL ELECTRIC ARC FLASH HAZARD, DISCONNECT FEEDER BREAKER BEFORE SERVICING”, or similar note conforming to the requirements of NEC 110.16 “Arc Flash Hazard Warning.” Warning label shall also conform to ANSI Z535.4-2002 “Product Safety Signs and Labels.”
- g. The power feeding the pump control panel will be 480 VAC, three (3) phase, Three (3)-wire, 60 HZ.

2. Control Description

- a. A microprocessor based pump controller shall be provided to monitor wet well level via remote sensor as specified hereinafter and provide Duplex pump down mode pump control. The pumps shall start and stop as required to maintain an acceptable level.
- b. If the capacity of the lead pump is less than the influent flow, the lag 1 pump shall be called to start. If the capacity of both pumps running in parallel is greater than the influent flow, the lag shall stop when the wet well level falls to the lag pump stop setpoint. The lead pump will continue to run.
- c. If the capacity of the lead pump is greater than the influent flow, it shall stop when the level falls to the lead pump stop setpoint. The pumps shall alternate after each complete operating cycle if alternation is enabled.
- d. The pump control panel shall include the following described equipment in Paragraph 3 of this document (installed complete and operational), as well as that shown on the Plans and specified herein.

3. Components

- a. Power Distribution Blocks: Each power distribution terminal block shall be provided with a clear plexiglass cover. Terminal block shall be Square D Class 9080, or approved equal sized as required for the respective conductors. All terminal blocks shall be rated 600 volt with amperage ratings in conformance with NEC Table 310-16 using 75 degrees C wire for the respective lug wire range.
- b. Secondary Surge Protector: AC surge protector shall be UL listed per UL 1449, third edition, suitable for 480 VAC, three (3) phase, three (3)-wire plus ground system, with surge current rating of 40 kA per mode 8/20 μ s (20kV) wave, and status indication lights, Joslyn 1451-49 or approved equal.

- c. Control Power Transformer (2 kVA minimum): Control transformer and power supply shall be provided to provide the 120 VAC for control circuits when required. Transformers shall have circuit breaker over current protection on the primary and secondary circuits. The secondary windings shall be grounded. Control Power Transformer larger than 2 kVA shall be externally mounted on the control side of the enclosure and shall be supplied in a NEMA 4X stainless steel nonventilated weatherproof housing. Primary and Secondary Protection shall be provided for transformer. The overcurrent protection shall be achieved with fuses. The control power transformer shall Square D Type T, TF or approved equal.
- d. Circuit breakers: Circuit breakers for motor circuits, control circuits, and other branch circuits shall be thermal magnetic, molded case, 100-Amp frame minimum, 10,000 Amps symmetrical, interrupting current rating at 120/240 VAC for one-pole and two-pole breakers and 22,000 Amps symmetrical, interrupting current rating at 480 VAC for three-pole breakers as manufactured by Square D, or approved equal. Breakers shall have “on”, “off” and “tripped” positions and shall be UL-listed. Breakers shall be sized as required for the respective equipment in accordance with NEC and the respective equipment manufacturer’s recommendation. Include breakers for the following equipment as a minimum.
 - i. Pump motor #1 branch breaker.
 - ii. Pump motor #2 branch breaker.
 - iii. Pump control panel control circuit.
 - iv. Accessories (GFCI receptacle, and heater)
 - v. Alarm System
- e. Reduced Voltage Solid State Starter (RVSS):
 - i. This specification describes the required performance, functional characteristics, fabrication details and installation of a microprocessor controlled low voltage Softstarter, used for stepless start and stop as well as protecting of standard AC squirrel cage induction motors.
 - ii. The softstarter shall be ABB Type PSE Series, Eaton Cutler-Hammer S 811 or pre-approved equal. The softstarter shall contain at least the features, functions and adjustments described below, in order to provide the motor and application with sufficient protection, and start and stop the motor in a precise and controlled manner.
 - iii. Operator Interface (Human Machine Interface –HMI). The starter shall be operated with a LCD display presenting all data and information using a language neutral icons and figures. All numbers shall be presented using four positions, seven segments. The use of binary, hexadecimal code, or any other code is not acceptable and currents and measurements shall be presented as either exact values or as a percentage of the maximum value. Adjustments shall be made by

a digital four push button keypad. No binary coded dipperswitches shall be used for programming or function selection. The HMI shall be possible to lock to prevent unauthorized changes to the programming. Data should always be presented with the actual value, and the unit of the data (i.e. V, A or %, etc.). Data entered and selections made to the Softstarter using the display and keypad should be stored in case of a power loss. LED Indicators using long life LEDs shall provide additional quick annunciation.

- f. Mode Select: Method of operation shall be by a three position maintained “Hand-Off-Auto” selector switch provided for each pump. Selector switch shall be water-tight/oil tight (NEMA 4/13) Allen Bradley 800T Series, Square D Class 9001, Type K, or Eaton Cutler-Hammer E22 or Cat. No. 10250 Series. Position commands are as follows:
 - i. Hand – In this position, the applicable pump shall run without regard for the level sensing commands and will relay on operator discipline to run and stop.
 - ii. Off – In this position, the applicable pump will not run under any circumstances.
 - iii. Auto – In this position, the pressure transducer, float switches and respective control relays shall control the applicable pump. The pressure transducer will sense the appropriate levels in the wet well and initiate start and stop commands to the pump through the associated control relays. Floats will act as a backup to the pressure transducer in the event the transducer fails.
- g. Legend Plates: Legend plates shall be required for all starters, circuit breakers, pilot lights, control panels, and disconnects. Legend plates shall be provided to identify the equipment controlled and the function of each pushbutton, indicating light, pilot light, selector switch and device. Legend plates shall be weatherproof and abrasion resistant phenolic materials. Lettering shall be black on white background, unless otherwise noted.
- h. Condensation Heater: Provide a condensation strip type heater sized as required for the pump control panel enclosure to minimize moisture that may accumulate inside the enclosure. Heater shall be sized to maintain a minimum internal enclosure temperature of approximately 50 degrees F for an outside design temperature of -15 degrees F. Include integral thermostat and circulating fan for condensation heater. Circulating fan shall be 4 in. to 6 in. nominal diameter axial type fan with wire guards, 115 VAC, 60 Hz. Thermostat shall be line voltage thermostat, 120 VAC, 5-Amp minimum current rating, SPST, with adjustable control knob as manufactured by Honeywell, White-Rogers, Hammond, Hoffman, Rittal, or Chromalox.

- i. Convenience Duplex Receptacle: Provide a duplex receptacle with ground fault circuit interrupter. Receptacle shall be rated 120 VAC, 60 Hz, and 15 Amps with a trip threshold of 5 ± 1 milliamp. Receptacle shall be a UL Class A GFCI unit complying with and tested in accordance with UL Standard No. 943. GFCI shall be as manufactured by Leviton, Hubbell, Eagle, Arrow-Hart, Bryant, or Pass & Seymour.
- j. Pump Motor Thermal Trip: A thermal trip on the motor will cause immediate shutdown and activate the respective thermal trip condition alarm. Pump motor thermal trip shall be wired to provide manual reset and restarting of the pump motor in conformance with the recommendations of the respective submersible pump manufacturer's representative. Provide interposing relays as required. Verify thermal trip requirements with the respective submersible pump manufacturer.
- k. Pump Motor Seal Leak Detection: The seal leak detection on the motor shall shut down the pump and activate the respective seal leak alarm as required/recommended by the respective submersible pump manufacturer's representative.
 - i. Provide interposing relays as required. Verify seal leak requirements with the respective submersible pump manufacturer.
- l. Motor Monitor Relays: Motor monitor relay shall be provided by the pump vendor or be a model approved by the pump vendor to ensure the pump warranty is maintained.
- m. Enclosure Light: Provide a 60-watt incandescent light fixture for the pump control panel enclosure with door activated switch. Light fixture shall be Hoffman Catalog Number A-LTDB1, or approved equal. Include lamps for respective fixture.
- n. Construction Standards
 - i. Wire Numbers – Each wire in the control panel shall be marked with a wire number that corresponds to the page and ladder rung of the schematic diagrams. A unique wire number shall be provided between component contacts and coils. Wire markers shall be Brady Thermal Transfer Self-Laminating Vinyl or equal by Grafoplast or Thomas & Betts.
 - ii. Color Coding – Wires shall also be color-coded as follows: 120 VAC Line = black; Neutral = white; Ground = green; Switched 120 VAC = red; DC current carrying conductor = blue, DC non-current carrying conductor = white with blue stripe, Foreign voltage = yellow, Intrinsically safe = light blue.
 - iii. Component Identification – Each component in the system shall be identified by a unique number that corresponds to its coil's page and ladder rung location on the schematic drawings.

- iv. Wire – AC control conductors shall be 600 volt and a minimum of 18 gauge. DC control conductors shall be a 300-volt and a minimum of 18 gauge. Control conductors shall be UL Type MTW rated for 105 degrees C. Analog conductors shall be 22 gauge shielded twisted three conductor rated for 300 volts. Wire shall be Beldon 8771 or equal. Shields shall be grounded at the PLC or panel location. Power conductors shall be sized per UL and NEC standards and rated for 600 volts. Conductors shall be UL Type MTW, THHN or THWN rated for 90 degrees C.
- v. Control Terminals – All field control conductors shall be connected to terminal blocks. Terminals shall have machine marked wire numbers. Connection of field control conductors directly to control panel components will not be allowed. Terminal blocks shall be rated for 30 amps at 600 volts. They shall be screw terminal type capable of terminating No. 10 to 26 gauge wire. Terminal bridge bars shall be provided when it is necessary to bridge multiple like terminals together. Terminals and accessories shall be Phoenix Contact “Cipline” or equal by Allen Bradley or Weidemueller 21.
- vi. Provide one (1) box (five (5) minimum quantity) of each type and size of fuse, upon completion of the job, for use as spares.
- vii. A schematic diagram (showing wire color) shall be permanently fastened to the inside of the enclosure. An Installation and Service Manual shall also be included with each control panel. The control panel shall be U.L. listed as an assembly.
- viii. Ground Bar. Provide ground bar mounted and bonded inside the panel enclosure.
- ix. Wiring Duct. Provide wiring duct to route conduits as necessary for a neat and workable installation.
- o. Level Controller
 - i. General
 - 1. The Lift Station Controller shall be an off-the-shelf, preprogrammed, dedicated to the application, microprocessor based controller capable of monitoring process variable inputs and automatically control up to two constant speed pumps. Systems using a one of a kind, non-standardized, custom programming generic controller represent additional complexity and unproven operation and thus are not in conformance to the intent of the these specifications and will not be acceptable.

2. Controller shall be configured for the number of pumps to be controlled at this lift station as per these specifications.
 3. The operator interface shall display the current level in feet and represent the level in bar graph form, which dynamically updates based on the level in the wet well.
 4. An active/dynamic graphical representation of each pump and its status shall be displayed on the same screen along with flow in gallons per minute. Pump graphic shall change state to indicate – “Off”, “Called”, “Running”, and “Failed/Out of Service”.
 5. Touching an active pump on the home screen takes you to the respective pump status screen.
 6. A trend screen showing, a minimum of, the last two (2) hours of wet well level fluctuations shall also be available.
 7. The operator interface shall have a display area not less than 3.5 in. with 160 x 128 pixel resolution, Transflex touch screen graphic display viewable in direct sunlight.
 8. The operator interface shall be suitable for Type 12, 4 & 4X environment. Additionally, the display shall be manufactured from a UV resistant polyester substrate.
 9. To prevent the loss of data during an extended power outage, longer than four (4) hours, the controller shall have a built in replaceable battery system to keep volatile memory active for approximately ten (10) years.
- ii. Inputs & Outputs: The controller shall come standard with herein specified inputs and outputs. The controller shall also have the ability to accommodate additional expansion I/O without the need to replace hardware or upgrade the controller.
- iii. The controller shall be configured to monitor the following discrete input status signals:
1. Pump 1, 2 Running
 2. Pump 1, 2 HOA In Auto
 3. Pump 1, 2 Seal Failure
 4. Pump 1, 2 Overtemp
 5. Pump 1, 2 Overload
 6. Backup Active
 7. High Level Float
 8. Low Level Float
 9. Control Power Failure

10. Phase Failure
 11. Station Intrusion
 12. Flow Pulse
 13. Temp Alarm High/Low
- iv. The controller shall provide the following discrete output signals:
1. Pump 1, 2 Call
 2. Pump 1, 2 Failure
 3. Common Alarm
 4. Alarm Horn
 5. Alarm Horn Silence
 6. Backup Reset
- v. The controller shall monitor the following (4-20 mA) process signals:
1. Wet Well Level
- vi. A two level security system shall be provided for operators (OPER) and supervisors (SUPER). Without being logged in, screens are view only.
- vii. OPER – Operator Access
1. Rights to edit set points and acknowledge alarms
- viii. SUPER – Supervisor Access
1. All privileges as the OPER
 2. Right to change the passwords of both SUPER and OPER users
 3. Right to set lifetime pump runtime and start totals
 4. Right to toggle communication ports between telemetry communications or local programming modes
 5. Right to set the controller time and date
 6. Right to access removable media system screen
 7. Shall be provided with factory default passwords
 8. To prevent unauthorized controller adjustments, an adjustable 0-999 second delay shall be provided to automatically logoff the current user after the adjustable time period, and no operator screen navigation has been detected.
 9. The controller shall be capable of operating pumps in an automatic or fixed mode. In automatic mode, a built in alternator shall be available to equalize motor starts, stops and run time. The alternator shall have the capability of being put into fixed sequence mode at any time. Alternation shall also have the capability to alternate cyclically or following an adjustable period of time.
- p. Alternation
- i. Alternator shall have pump fail replace logic allowing a failed pump to be detected and the lag pump to be called into service without level increasing to lag start setpoint.

ii. Auto Alternation Mode

1. If the running signal input is not received within 60 seconds (adjustable) of the respective pump being called to start, a pump failure alarm shall be displayed in the alarm banner and the next pump in sequence shall be called to start.

iii. Fixed Alternation Mode

1. If the running signal input is not received within 60 seconds (adjustable) of the respective pump being called the respective pump shall continue to be called until the level in the wet well reaches the next level setpoint at which point the next pump in the sequence shall be called to start.

q. Setpoints

- i. The following system setpoints shall be provided: (* indicates an associated, user adjustable (0-999) seconds time delay shall also be provided to prevent momentary process fluctuations from impacting alarm or control.)

	<u>Cook</u>	<u>South Grand</u>
	10 ft	10 ft
	8 ft, 10 ft	8 ft, 11ft
	2 ft, 2ft	2 ft, 2ft
1. Wet Well Level High and Low Level Alarm *	20 sec	20 sec
2. Start Lead*, Lag 1*	20 sec	20 sec
3. Stop Lead*, Lag 1*,	20 sec	20 sec
4. Pump 1, 2 Failure To Start Delay		
5. Pump 1, 2 Seal Failure Delay		
6. Pump 1, 2 Over Temp Delay		

r. Alarms

- i. The controller shall monitor, display and log the following alarms:
 1. High or Low Wet Well Level Alarm (Transducer)
 2. Pump 1, 2 Seal Failure
 3. Pump 1, 2 Over Temp
 4. Pump 1, 2 Overload
 5. Pump 1, 2 Failure (internal to controller, Call No Run)
 6. Float Backup Active
 7. Low Level Cutout (from floats)
 8. High Level Alarm (from floats)
 9. Control Power Failure
 10. Phase Failure

s. Pump Status

- i. The controller shall have Pump Status screens that provide the following information and control options:
 1. Pump 1, 2 Status (Off, Called, Running, & Failed)
 2. Pump 1, 2 Hard and Soft H-O-A Status
 3. Pump 1, 2 Seal Failure Status
 4. Pump 1, 2 Over Temp Status
 5. Pump 1, 2 Overload Status

6. Today: Pump 1, 2 Runtime xx.x Hours
7. Today: Pump 1, 2 Starts xxx
8. Yesterday: Pump 1, 2 Runtime xx.x Hours
9. Yesterday: Pump 1, 2 Starts xxx
10. Current (CRNT) Month (MNTH): Pump 1, 2 Runtime xxx.x Hours
11. Current (CRNT) Month (MNTH): Pump 1, 2 Starts xxx
12. Last Month (MNTH): Pump 1, 2 Runtime xxx.x Hours
13. Last Month (MNTH): Pump 1, 2 Starts xxx
14. Total: Pump 1, 2 Runtime 999999.9 Hours
15. Total: Pump 1, 2 Starts 999999

t. Navigation

- i. A menu system shall be provided for the user with proper access to change setpoints, setup pump starts, stops, alarms, alarm delays and setup pump alternation. The following parameters shall be provided:
 - ii. Level and Level Delay Setpoints
 - iii. Alternation – Auto or Fixed mode; Timed or Cyclical
 - iv. The operator shall have a choice of selecting automatic or a fixed sequence.
 1. Pump Failure – call, no run
 2. The user shall be able to enter pump failure time for each pump that is enabled. A failed pump will be replaced with the next available pump.
 - v. Seal Failure and Over Temp
 1. The user shall be able to enter seal failure and over temp time delays for each respective pump that is enabled.
 - vi. Miscellaneous Alarms
 1. The user shall be able to enter delays for communications failure, intrusion and high or low temperature.
 2. Transducer Range (wet well level)
 - vii. A field shall be provided to scale the transducer in feet to setup the vertical scale on the Home screen and an adjustable offset in feet, shall be provided to compensate for the transducer to be raised off the bottom.

u. Volumetric Flow Calculation

- i. The controller shall provide station flow information based on external flow transmitter or based on high accuracy volumetric process calculations using wet well level excursions as sensed by wet well level transmitter in conjunction with verified pump operations. Systems that do not monitor/use actual pump run feedback in the calculation are deemed unreliable and will not be acceptable.

- ii. The controller shall provide the following flow related information as a minimum:
 - 1. Station incoming flow rate (Average).
 - 2. Station Effluent Today's flow total.
 - 3. Station Effluent Yesterday's flow total
 - 4. Station Effluent Previous Month Flow Total
 - 5. Station Effluent Current Month Flow Total

- v. Historical Data Storage
 - i. Controller shall log the pump run time data, alarms and analog data to the removable memory card.

- w. Submersible Level Sensor
 - i. General
 - 1. A loop powered submersible level transmitter shall be provided to sense the wet well level. The wet well level transducer shall sense wet well level by measuring the hydrostatic head pressure associated with water levels above the base of the diaphragm. A linear and proportional, to hydrostatic head pressure, 4-20 mA signal shall be produced and input to the pump controller. The transducer shall be installed in accordance with manufacturer's instructions.
 - 2. The pressure transducer shall be certified by FM, UL, and CSA for installation in a Class I, Division 1, Groups A, B, C, and D, Class II, Division 1, Groups E, F, and G, Class III, Division 1 hazardous location when connected to associated apparatus manufactured by PR Electronics, R.G. Stahl and others. The transducer shall be installed in accordance with manufacturer's instructions.
 - 3. The pressure transducer wetted materials shall be 316 SS, Viton®, Polyurethane or Tefzel®.
 - 4. Sensing diaphragm shall be 2.75 in. in diameter and include diaphragm protector allowing the unit to be placed on or near the bottom of the wet well without affecting pressure readings.
 - 5. The transducer shall include circuitry that provides protection from overvoltage, reverse polarity and shorted output.
 - 6. Transducer overall accuracy shall be 0.25 percent full scale or better with a resolution of .0001 percent over the entire range of the wet well.
 - 7. The sensing element shall exhibit non measurable hysteresis, withstand overpressures to 200 percent of rated range without damage.

- ii. Warranty
 - 1. Transducer unit shall have a manufacturer's life time warranty that includes damage from electrical surges.
 - iii. Construction
 - 1. The pressure transducer shall be mounted in the wet well and furnished with a minimum of 75 ft of cable for Cook Street and minimum of 60 ft cable for South Grand Avenue.
 - 2. The cable shall be 0.3 in. outside diameter Polyurethane or Tefzel® material.
 - 3. Cable shall have non stretch Kevlar reinforcement strands bundled within the wiring cable to provide additional cable strength. Cable strength shall allow up to 200 lbs of pulling strength.
 - 4. A sealed breather tube system shall extend from the top of the cable to the transducer assembly to provide barometric compensation to the transducer.
 - 5. Breather system will be sealed and maintenance free. Systems that use gaps in wire cable and or desiccant filters that require periodic replacement will not be considered.
 - iv. Installation & Mounting
 - 1. The transducer shall be suspension mounted in the wet well in an area of the wet well allowing full measurement of the wet well and in such a manner as to not be adversely affected by motor operation or incoming flow streams.
 - v. The transducer shall be mounted so that it is approximately 6 in. above the floor of the wet well.
 - vi. The transducer shall be furnished with a suspension mounting kit made out of stainless steel. It shall include a stabilization weight to maintain its position in the wet well.
- x. Cellular Based Communication System: Mission M800 RTU
- i. Furnish and install a factory wireless data cellular based communication system for the purpose of monitoring and controlling various equipment operations. The supplier of the communication system shall be responsible for coordination required to insure equipment compatibility. The communication system shall be provided complete, in place, as specified herein and needed for a complete, proper installation.
 - ii. The Contractor shall be responsible for coordinating the instrumentation equipment, communication equipment and other related equipment so that all elements are compatible and form a complete working system.

Shop drawing submittals shall include sufficient information regarding component compatibility to demonstrate compliance with this requirement.

- iii. Qualifications of Manufacturers Products used in the work of this Section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of satisfactory production acceptable to the Engineer.
- iv. The submitting Company shall provide evidence of, and warrant compliance with, substantially all below listed requirements.
 - 1. The submitting Company shall have been in business providing remote facility monitoring and control services through the data side of the cellular system to the water distribution / wastewater collection industry or a substantially similar industry for at least six (6) years.
 - 2. The submitting Company shall be the actual manufacturer and operator, or a duly authorized and trained agent of the manufacturing company or a combination of both, who will actually provide, maintain, and warranty the proposed system.
 - 3. The Manufacturing Company of the field equipment shall also be the provider of all monitoring related services associated with the field equipment and all ongoing service agreements will be with the actual company providing the monitoring service, not a subcontractor or agent.
 - 4. The submitting Company shall have a primary central monitoring and control center and a fully redundant, physically separate, backup-computer monitoring center. Either center shall have the capability of operating all the remote monitoring and control field RTU's.
 - 5. The submitting Company shall offer and provide 24 x 7, 365 technical support.
- v. System Components
 - 1. Microprocessor Based Field RTU
 - a. Data Cellular Radio
 - i. The Remote Terminal Unit (RTU) shall incorporate a radio that utilizes the data side of any cellular system to transmit the data and alarms monitored, as well as receive manual or automated control commands.
 - ii. Cellular radios from all cellular carriers shall be able to mount in the same mounting port on the motherboard

and consequently be interchangeable in no more than 10 minutes.

- b. NEMA4X enclosure with the battery inside and which has front door and top “sun shades” to reduce internal temperatures when placed in the sun.
- c. Microprocessor Feature Updates
 - i. Microprocessor features like data transmission rates shall be able to be adjusted through the cellular system without any site visits necessary.
- d. RTU Inputs and Outputs
 - i. RTU shall have eight (8) digital inputs. These eight (8) inputs shall have end of line resistor supervision, or similar supervision, that can detect normal alarm trip inputs and detect input wiring disconnection/shorting as a distinctly different signal and report.
 - ii. RTU shall have an optional expansion board of an additional eight (8) digital inputs
 - iii. The digital inputs shall be user selectable as normally open (NO) or normally closed (NC).
 - iv. In M800 Models eight of the RTU digital inputs on main board shall be capable of being programmed to record and report pump run times in one minute increments or less as indicated by a relay opening and closing. If only two pumps are monitored then the unit shall also be capable of recording and reporting simultaneous pump run times.
 - v. RTU shall have built-in alarms for input wiring fault, AC failure, communication failure and low battery detection.
 - vi. RTU shall have two (2) analog inputs measuring four (4)-20mA or 1-5 VDC at 10 bit resolution with four (4) alarm thresholds per input.
 - vii. RTU shall have an optional expansion board of an additional four (4) analog inputs
 - viii. RTU shall have an optional expansion board of an additional eight (8) digital inputs
 - ix. RTU shall have an optional expansion board of an additional two (2) analog outputs.
 - x. RTU shall have an optional expansion board of two (2) pulse counter inputs
 - xi. RTU shall have an electronic key reader input to monitor on-site personnel. The RTU shall utilize an audible tone to verify key reading. Each key in the system shall provide unique identification of the key holder when they are on site vs. “someone” is on site.
 - xii. RTU shall have three (3) digital normally open or closed output relays rated 1/2 ampere@ 120VAC
- e. Status LED’s on Motherboard

encryption shall be at all stages of data transfer and storage

- iii. The cellular radios shall all have private IP addresses
 - iv. The submitting company shall have established multiple, private gateways through the cellular system, completely behind firewalls, with at least one of the cellular providers.
- d. Data Transmission Rates
- i. All alarms regardless of unit type shall be transmitted immediately upon occurrence; delays can be added by the Owner at the RTU or the supplier's website.
 - ii. The RTU shall continuously transmit all digital state changes on an as occurs basis; analog and pulse inputs will be transmitted at least once every two minutes on M800 models.
 - iii. The RTU shall have an effective, continuous, transfer rate of at least 19,200 baud.
- e. Communication Link Structure and Performance Criteria
- i. The communication link structure shall be a secure socket connection from the RTU through the cellular system to the supplier's servers, and it shall be a continuous connection, 24 x 7, 365.
 - ii. Receipt of all data sent from the RTU to the server center shall be acknowledged by the server center back to the RTU in real time for every data packet sent. Such structure is called end-to-end data acknowledgement.
 - iii. The secure socket connection shall be from the RTU through the cellular system direct to the system supplier; no third parties shall receive the data from the cellular carrier and then pass it to the system supplier.
 - iv. The above mentioned secure socket connection shall be monitored for end-to-end uptime with interruptions as small as 15 seconds being captured.
 - v. Both end-to-end uptime and the number of times the link was disconnected/reconnected shall be reported for each RTU continuously with daily summary statistics posted on the Owner's website. All the end-to-end uptime history of each RTU shall be available on the Owner's web site from when it first powered up to the present. Weekly management summaries of each RTUs end-to-end uptime shall be automatically emailed to the Owner.

3. Alarm System Structure and Software

a. Alarm Delivery Formats

- i. Alarms shall be delivered in the following formats:

- ii. Phone (voice call), fax, pager (numeric or alphanumeric (short alpha or long alpha format), text message, email, or any combination of the above simultaneously.
 - iii. Alarms shall be able to be acknowledged by phone, text message, two (2)-way pager, email or on the Owner web site.
 - iv. Voice alarm acknowledgement shall be adjustable to be able to mimic the format of dialers.
 - v. Alarms shall be called out on alarm and upon return to normal conditions.
 - vi. Return to normal alarms can be adjusted to call the alarm callout group or a different callout group.
- b. Alarm Callout Formats
- i. Alarm callout groups shall be able to be setup to automatically switch between callout groups at different hours of the day and/or different days of the week.
 - ii. Alarm callout groups shall be able to have multiple teams within each group to easily facilitate rotation of teams of on-call personnel.
- c. Alarm Message Formats
- i. All alarms shall have the alarm condition, time, alarm location and pump status at the time of the alarm in each message.
 - ii. Alarm message format shall be adjustable to include just the above information when calling a phone where it is known who will answer the phone, or be adjustable to add an introductory message asking for a specific person when calling a phone where it is not known who will answer the phone (like a home phone).
 - iii. Alarms shall be able to be delivered individually or be able to be grouped into one message so that multiple, simultaneous alarms (like AC Fail at multiple sites) can be delivered and acknowledged in one phone call.
- d. Alarm Dispatch Logs
- i. Each alarm shall have a full log of each notification attempt of that alarm documenting the following:
 - ii. Date, time, and alarm condition
 - iii. If each notification attempt was a success or failure and the reason for each failure if an attempt was a failure (like line busy, call dropped, etc.)
 - iv. A recording of each voice notification attempt so the specific reason for a notification failure can be known.
 - v. Date, time, and name of person who acknowledged the alarm.
- e. Voice Alarm Delivery Capacity

- i. Manufacturer shall provide at least twenty (20) outbound lines to deliver voice alarms so as not delay delivery of current alarms.
4. Remote Data Access
- a. Remote Data Access Format
 - i. Data collected by the system shall be able to be remotely accessed by simple web browser. The system shall provide individual web pages for the User to access via any web browser.
 - ii. To access the web pages, the User shall have to enter a User Name and Password.
 - iii. The User can set up any of three levels of access to the web pages:
 - Read only...can see but cannot make any changes
 - Read/Write...can see and can make changes
 - Read/Write/Control...can see, make changes and effect control functions, also add or remove logins/ passwords.
 - iv. The vendor shall provide at least two separate web sites for the Owner. One shall be designed to be viewed on a traditional laptop or desktop computer. The other shall be designed to be viewed on a web enabled cell phone or PDA. This web site shall still have graphs showing trending of data, and shall be designed to minimize the data sent so as to minimize the page loading times and size of the data plans necessary to view the site on a web enabled cell phone or PDA.
 - v. The system supplier shall provide secure access through a specified phone without the need for web access (Voice SCADA). This shall require login to system via numeric 5 digit code and must be set up in the system to an associated login for that site to a specific phone number to maintain site security.
 - vi. In addition to the above web sites, the User will be provided at no additional charge with a customizable software interface that shall display real-time status and graphic trending of data collected by the M800 RTU.
 - vii. The software shall be downloadable from the Mission customer website.
 - viii. The software shall automatically update itself every time the User accesses the software.
 - ix. The software shall require NO programming to customize.

x. The software shall be the Mission Real Time Viewer.

b. Remote Access Security

i. In addition to the Username and Password structure described above, all access of the User web site shall be logged. Such logging data to include date, time and duration of access, User Name and Password of user to access the site and IP address of the accessing computer. The log shall be accessible through the User web site

c. Automated Administrative Reports and Alerts

ii. The User web site shall produce and automatically deliver weekly reports which summarize alarms and responses, pump runtimes and flow estimates, weekly end-to-end uptime percentages of each RTU, and all electronic key uses at the RTU sites.

iii. The web site shall be capable of sending two (2) different categories of notifications, Alarms and Alerts. Alarms are for conditions that the User decides they want to be notified immediately about. Alerts are conditions that need attention, but are not so time sensitive that they cannot wait till the next morning.

- The Alarms callout list and the Alert callout list shall be able to be separate and distinctly different.

iv. The User web site shall analyze daily pump run times at compared to a moving 30 day average of the pumps most recent runtimes and automatically Alert the User that the pump runs are outside the normal runtime variation pattern.

v. The User web site shall analyze hourly pump runtimes and automatically compare it to two (2) User set thresholds. If the Alert threshold is exceeded, an Alert shall be sent the following morning. If the Alarm threshold is exceeded, an alarm shall be sent immediately.

vi. The User web site shall send an Alert the first morning that the units are in Communications fail even though Alarms have been sent at the time the RTUs went off-line. Such Alerts are a reminder to Management that they still have units that are off line.

5. RTU Locations

a. The RTU shall be located at the Carpenter Street Pump Station and shall be furnished with an omnidirectional antenna at grade plus 8 ft. Provide a support pole and foundation for the

antenna. The antenna shall be grounded to a driven ground rod.

6. Monitoring Points per RTU

a. The inputs to be monitored are as follows:

i. Digital inputs

DI-1 Pump 1 Run
DI-2 Pump 2 Run
DI-3 Pump 1 Alarm
DI-4 Pump 2 Alarm
DI-5 Pump 1 Runtime
DI-6 Pump 2 Runtime
DI-7 Power Failure
DI-8 Wet Well High Level Alarm Backup

ii. Analog inputs with four (4) hi/low threshold alarms

AI-1 Pressure Transducer
AI-2 Spare

iii. Relay Outputs

R-1 Spare
R-2 Spare
R-3 Spare

7. Other Materials

a. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

8. Coordination

a. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

9. Installation

a. Install the work of this Section in strict accordance with the manufacturer's recommendations and shop drawings as approved by the Engineer.

b. Upon completion of the installation, carefully inspect each component and verify that all items have been installed in their proper location, adequately anchored, and adjusted to achieve optimum operation. If required, the Contractor shall adjust the antenna placement or elevation to obtain consistent, stable operation of the system.

c. Delineate timing of RTU installation and commissioning.

10. Service

- a. Demonstrate to the Owner's operation and maintenance personnel the proper methods for operating and maintaining the equipment, and the contents of the operation and maintenance manual.
- b. The Contractor shall furnish to the Owner, through the Engineer, a written report prepared by the instrumentation equipment manufacturer's field service technician certifying that:
 - i. The equipment has been properly installed in accordance with manufacturer's recommendations.
 - ii. The equipment check out and initial start-up activities have been completed in accordance with manufacturer's recommendations and under the technician's supervision.
 - iii. Antenna placement has been optimized.
 - iv. The equipment is free from any undue stress imposed by connecting conduit or anchor bolts.
 - v. The equipment operates satisfactorily and in compliance with the requirements of this Section.

General: This work includes all excavation, backfill, temporary shoring, labor, materials and equipment required to manufacture, furnish, and install the valve vault, lid, access frame and hatch, butyl rubber sealant, pumps, pump bases, rails, lift chain, cable and chain brackets, pump rail brackets, testing, and other incidental items as shown on the plans.

The pump station control panel and accessories, and wireless monitoring and control system shall be included in the cost of the Pumping Station. Connections to conduits and wiring external to the control panel shall be included in the cost of Pump Station Electrical Work.

Basis of Payment: This work will be paid for at the contract lump sum price for PUMPING STATION, NO. 1 AND PUMPING STATION, NO. 2.

QC/QA OF CONCRETE MIXTURES - APPLICABLE ITEMS

The Special Provision for "Quality Control/Quality Assurance of Concrete Mixtures" (Recurring Special Provision Check Sheet Item #25) shall only apply to the following:

Pay Item:	All Items Utilizing Self-Consolidating Concrete
Location:	All Applicable
Pay Item:	Superstructure Concrete
Location:	Bridge Decks

All other Portland Cement Concrete utilized in the construction of this project shall be produced in accordance with Check Sheet item #24 for "Quality Control of Concrete Mixtures at the Plant."

REMOVAL OF UNCLASSIFIED MATERIAL

Description: This work shall consist of removing any unclassified material including culverts, broken concrete, and existing roadway surface found on this project as designated by the Engineer.

The material shall be disposed of beyond the limits of the right of way in accordance with Article 202.03 of the Standard Specifications, and as directed by the Engineer.

Compliance with this Special Provision will not be paid for separately but will be included in the project contract.

RETAINING WALL REMOVAL (X3400004)

This work shall consist of removing part of the existing retaining wall, foundation wall or precast concrete modular wall as shown on the plans and as directed by the Engineer. This removal shall be according to Section 501 of the IDOT SSRBC and as described herein.

All rubbish, concrete, reinforcement bars and other debris as the result of the removal operations shall be disposed of by the Contractor at off-site locations provided by the Contractor.

All labor and equipment to perform this work shall be paid for at the contract unit price per foot for RETAINING WALL REMOVAL (X3400004) and no additional compensation will be allowed.

SANITARY SEWER

This work will be in accordance with Section 550 of the Standard Specification for Road and Bridge Construction except as follows:

Materials: Except as noted below, all pipe shall be reinforced concrete conforming to ASTM designation C76 of the size and Class shown on the plans. The material for all pipe within 10 ft of any water line crossing shall be in accordance with the Special Provisions for Storm Sewer – Water Main Requirements. Concrete pipe joints shall conform to ASTM C361 or C443 for flexible gasket material. All pipe shall be marked with the pipe type, grade and standard. All pipe to manhole connectors shall be A-Lok, Kor-N-Seal or Press-Seal type, cast in the structure connectors.

Water Main Separation:

Sanitary sewers shall be separated from water lines (horizontal and vertical) as required by Section 41-2 of the Standard Specifications for water and sewer main construction.

Testing and Inspection:

In addition to the requirements of the Standard Specifications for Road and Bridge Construction, all sanitary sewers shall be tested and inspected by exfiltration of air under pressure in accordance with Section 31-1.12 of the current edition of the Standard Specifications for Water and Sewer Main Construction in Illinois.

Sanitary Sewer Line Connections:

Sanitary sewer line connections to existing trunks, mains, laterals or side sewers shall be left uncovered until after an acceptance inspection has been made. The Engineer will make such inspection within two (2) working days after notification by the Contractor. After approval of the connection, the trench shall be backfilled as specified.

No existing sanitary sewer shall be connected to a new sanitary sewer unless specifically authorized in each instance by the Engineer.

Bypass Pumping:

Temporary bypass pumping will be from structure to structure. Any damage to or holes cut in existing or proposed pipes or structures will result in replacement of the pipe or structure. Patching will not be allowed.

Basis of Payment: This work, including elbows and any water main quality pipe, will be paid for at the contract unit price per foot measured along the centerline of pipes and elbows for SANITARY SEWER of the size shown on the plans. Payment for associated items listed in Section 550.10 shall be paid for in accordance with that section except that pipe elbows will not be measured separately for payment.

SAWING PAVEMENT (FULL DEPTH)

Description: This work shall be used in the removal of driveway pavement, sidewalk, pavement, curb, gutter and combination curb and gutter to ensure a satisfactory transition between replacements and the portion remaining in place. The contractor shall saw cut a joint between the portion of the driveway pavement, sidewalk, pavement and curb and gutter to be removed and that to be left in place in order to prevent the surface from spalling when the concrete is broken out. This work shall be done in such a manner that a straight joint will be secured.

Basis of Payment: This work will not be measured separately but shall be included in the contract unit price for the item to be removed.

SEWER IN METAL LINER

Description: This work shall consist of constructing reinforced concrete sanitary sewer in a metal liner at locations shown on the plans according to the special provision "STORM

SEWERS JACKED IN PLACE, except that the liner may be installed by open cut method.

All pipe shall be reinforced concrete conforming to ASTM designation C76 of the class shown on the plans. Concrete pipe joints shall conform to ASTM C361 or C443 for flexible gasket material. All pipe shall be marked with the pipe type, grade and standard. All pipe to manhole connectors shall be A-Lok, Kor-N-Seal or Press-Seal type, cast in the structure connectors.

Testing and Inspection:

In addition to the requirements of the Standard Specifications for Road and Bridge Construction, all sanitary sewers shall be tested and inspected in accordance with Section 31-1.12 of the current edition of the Standard Specifications for Water and Sewer Main Construction in Illinois.

Trench excavation, foundation preparation, and backfill for the metal liner shall be according to Article 550 of the SSRBC except as follows:

Aggregate for bedding and backfill shall be crushed stone with a top size of aggregate no greater than 2 in. and no more than 5 percent passing the number 200 sieve.

Backfill shall be in accordance with Section 208 of the SSRBC and shall be placed in loose 6 in. lifts and compacted to at least 95 percent of its maximum density with a moisture content that is no more than 1 percent greater of 2 percent less than the optimum moisture as determined according to AASHTO T 99 (Method C). When backfill is within 3 ft of the top of sub-ballast elevation, a compaction of at least 98 percent will be required.

Installation:

The Contractor may install the metal liner by jacking rather than open cut methods at the Contractor's option.

Basis of Payment: This work, regardless of whether installed by jacking or open cut methods, will be paid for at the contract unit price per foot for SEWER IN METAL LINER of the diameter specified which price shall include the concrete sanitary sewer, metal liner, including grouting all voids between the sewer and metal liner, and all other materials and equipment necessary to install the sewer and all excavation except excavation in rock. The Contractor may install the sewer in metal liner by jacking rather than open cut at no additional cost to the contract. Backfill will be paid for as TRENCH BACKFILL.

SIDEWALK REMOVAL

Description: This work shall be in accordance with Section 440 of the Standard Specification and shall include removal of concrete steps.

Steps will be measured for payment in place. Only the horizontal surface will be measured and the area computed in square yards. The vertical risers of steps will not be measured for payment.

Basis of Payment: The work will be paid for at the contract unit price per square foot for SIDEWALK REMOVAL.

SLOPE WALL, SPECIAL

Description: This work shall consist of constructing a new slope wall according to the lines and grades shown in the plans. The following special provision is written as if every other pad is poured at a time.

Ready Mix Plant will mix integral color 'Slate' or other dark gray color in the truck. Place concrete and spray a finishing aid (Day 1 or similar) to help close the surface since concrete will be poured at a very tight slump. After concrete has set up enough to texture, spray Liquid Release on the whole surface. Using the roller in combination with a skin mat, roll texture across the whole surface area. After texturing is complete, re-edge the perimeter using a 6" edger to remove texture and leave a smooth border.

At the top of wall, measure out area where Blue or 'Stone Gray' CEM-COAT will be applied and put a tooled joint or saw cut frame into picture frame area for future application of the color 'Stone Gray' or other light gray color area and Blue area.

Final finish entire area that is not Blue with concrete sealer.

Basis of Payment: All material, equipment and labor to perform this work shall be paid for at the contract unit price per square yard for SLOPE WALL, SPECIAL and shall be in accordance with Section 511 of the SSRBC and to the satisfaction of the Engineer.

STORM SEWERS JACKED IN PLACE

Description: This work shall consist of furnishing and installing by jacking a steel liner and then installing a sanitary sewer inside the liner in accordance with Section 552 of the Standard Specifications and this Special Provision. The metal liner shall be installed first, then the sanitary sewer installed inside the liner.

The smooth steel liner pipe shall meet the following minimum requirements:

- Material – Steel ASTM A-36 or AWWA C-206
- Inside Diameter – Shown on Plans
- Wall Thickness – Shown on Plans
- Manufacture – Rolled/Welded
- Grade – FY = 36 KSI minimum
- Joints – Full Depth Single "V" Groove Butt Weld
- Coating – Coal tar epoxy or bituminous asphalt

The sanitary sewer pipe (carrier pipe) shall be reinforced concrete pipe conforming to ASTM designation C76, of the class shown on the plans.

Concrete pipe joints shall conform to ASTM C361 or C443 for flexible gasket material. All pipe shall be marked with the pipe type, grade and standard. All pipe to manhole connectors shall be A-Lok, Kor-N-Seal or Press-Seal type, cast in the structure connectors.

In addition to the requirements of the Standard Specifications for Road and Bridge Construction, all sanitary sewers shall be tested and inspected in accordance with Section 31-1.12 of the current edition of the Standard Specifications for Water and Sewer Main Construction in Illinois.

The following Norfolk Southern Railroad (NS) requirements shall also apply:

General Requirements

- A. Bored, jacked or tunneled installations shall have a bore hole essentially the same as the outside diameter of the pipe plus the thickness of the protective coating.
- B. The use of water or other liquids to facilitate casing emplacement and spoil removal is prohibited.
- C. If during installation an obstruction is encountered which prevents installation of the pipe in accordance with this specification, the pipe shall be abandoned in place and immediately filled and grout. A new installation procedure and revised plans must be submitted to, and approved by, NS before work can resume.

Jacking (Steel Pipe) Installation Method

- A. This method consists of pushing sections of pipe into position with jacks placed against a backstop and excavation performed by hand from within the jacking shield at the head of the pipe. Ordinarily 36-in. (914 mm) pipe is the least size that should be used, since it is not practical to work within smaller diameter pipes.
- B. Jacking shall be in accordance with the current American Railway Engineering Association Specifications, Chapter 1, Part 4 "Earth Boring and Jacking Culvert Pipe Through Fills." This operation shall be conducted without hand-mining ahead of the pipe and without the use of any type of boring, auguring, or drilling equipment.
- C. Bracing and backstops shall be so designed and jacks of sufficient rating used so that the jacking can be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.
- D. Immediately upon completion of jacking operation, the installation shall be pressure grouted as per this specification.

Grouting

- A. For jacked and tunneled installations a uniform mixture of 1:6 (cement:sand)

cement grout shall be placed under pressure through the grout holes to fill any voids which exist between the pipe or liner plate and the undisturbed earth.

- B. Grouting shall start at the lowest hole in each grout panel and proceed upwards simultaneously on both sides of the pipe.
- C. A threaded plug shall be installed in each grout hole as the grouting is completed in that hole.
- D. When grouting tunnel liner plates, grouting shall be kept as close to the heading as possible, using grout stops behind the liner plates if necessary. In no event shall more than 6 lin. ft of tunnel be progressed beyond the grouting.
- E. The space between the carrier pipe and casing pipe shall be pressure grouted using a uniform mixture of 1:6 (cement:sand).

Soil Stabilization

- A. Pressure grouting of the soils or freezing of the soils before jacking, boring, or tunneling may be required at the direction of NS to stabilize the soils, control water, prevent loss of material and prevent settlement or displacement of embankment. Grout shall be cement, chemical or other special injection material selected to accomplish the necessary stabilization.
- B. The materials to be used and the method of injection shall be prepared by a Registered Professional Soils Engineer or by an experienced and qualified company specializing in this work and submitted for approval to NS before the start of work. Proof of experience and competency shall accompany the submission.

Dewatering

- A. When water is known or expected to be encountered, pumps of sufficient capacity to handle the flow shall be maintained at the site, provided the contractor has received approval from NS to operate them. Pumps in operation shall be constantly attended on a 24-hour basis until, in the sole judgment of NS, the operation can be safely halted. When dewatering, close observation shall be maintained to detect any settlement or displacement of railroad embankment, tracks, and facilities.

Safety Requirements

- A. All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains nor damage, destroy, or endanger the integrity of railroad facilities. All work on or near NS property shall be conducted in accordance with NS safety rules and regulations. The Contractor shall secure and comply with the NS safety rules and shall give written acknowledgement to NS that they have been received, read, and understood by the Contractor and its employees. Operations will be subject to NS inspection at any and all times.

- B. All cranes, lifts, or other equipment that will be operated in the vicinity of the railroads' electrification and power transmission facilities shall be electrically grounded as directed by NS.
- C. At all times when the work is being progressed, a field supervisor for the work with no less than 12 months experience in the operation of the equipment being used shall be present. If boring equipment or similar machines are being used, the machine operator also shall have no less than 12 months experience in the operation of the equipment being used.
- D. Whenever equipment or personnel are working closer than 15 ft (4.6 m) from the centerline of an adjacent track, that track shall be considered as being obstructed. Insofar as possible, all operations shall be conducted no less than this distance. Operations closer than 15 ft (4.6) from the centerline of a track shall be conducted only with the permission of, and as directed by, a duly qualified NS railroad employee present at the site of the work.
- E. Crossing of tracks at grade by equipment and personnel is prohibited except by prior arrangement with, and as directed by, NS.

Blasting

- A. Blasting will not be permitted.

Protection of Drainage Facilities

- A. If, in the course of construction, it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage, as approved by NS. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.
- B. Soil erosion methods shall be used to protect railroad ditches and other drainage facilities during construction on and adjacent to NS right-of-way.

Support of Excavation Adjacent to Track

1.0 Launching and Receiving Pits

- A. The location of the near edge of all pits is shown on the plans. The dimension of the pits shall be determined by the Contractor and be shown in the pit design plans submitted by the Contractor. The distance from centerline of adjacent track to face of pit or excavation shall be clearly labeled. Also, the elevation of the bottom of the pit or excavation must be shown on the profile.
- B. The face of all pits shall be located a minimum of 25 ft (7.6 m) from centerline of adjacent track, **measured at right angles to track**, unless otherwise approved by NS.

- C. If the bottom of the pit excavation intersects the theoretical railroad embankment line interlocking steel sheet piling, driven prior to excavation, must be used to protect the track stability. The use of trench boxes or similar devices are not acceptable in this area.
 - D. Design plans and computations for the pits, stamped by a Professional Engineer, must be submitted by the Contractor prior to start of construction. The Contractor shall obtain NS approval prior to beginning any work on or which may affect NS property.
 - E. The sheeting shall be designed to support all lateral forces caused by the earth, railroad and other surcharge loads.
 - F. After construction and backfilling, all sheet piling within 10 ft (3.0 m) of centerline track must be cut off 18 in. (457 mm) below final grade and left in place.
 - G. All excavated areas are to be illuminated (flashing warning lights not permitted), fenced and otherwise protected as directed by NS.
- 2.0 Parallel Trenching and Other Excavation
- A. When excavation for a pipeline or other structure will be within the theoretical railroad embankment line of an adjacent track, interlocking steel sheet piling will be required to protect the track.
 - B. The design and construction requirements for this construction shall be in accordance with the requirements of Section 1.0 Launching and Receiving Pits, included in this specification.
- 3.0 Inspection and Testing
- A. For pipelines carrying flammable or hazardous materials, ANSI Codes, current at time of constructing the pipeline, shall govern the inspection and testing of the facility on NS property, except as follows:
 - (1) One hundred percent of all field welds shall be inspected by radiographic examinations, and such field welds shall be inspected for 100 percent of the circumference.
 - (2) The proof testing of the strength of carrier pipe shall be in accordance with ANSI requirements.
- 4.0 Reimbursement of NS Costs
- A. All NS costs associated with the pipe installation (inspection, flagging, track work, protection of signal cables, etc.) will be reimbursed by the Department as Force Account Work according to the Construction Agreement with the railroads.

The Contractor shall follow all of the requirements contained in the NS Special Provision for Protection of Railway Interests.

Pipeline Marker Sign

The Contractor shall install pipeline marker signs directly above the centerline of the storm sewer at the railroad right-of-way limits, as shown in the plans. The signs shall be durable, weatherproof signs approved by the Engineer and shall show the following information:

CITY OF SPRINGFIELD
SEWER DIVISION
ROOM 203 MUNICIPAL CENTER WEST
300 SOUTH 7TH STREET
SPRINGFIELD, IL 62701
(217) 789-2255
COMBINED ** IN. SEWER
DEPTH TO TOP OF CASING * FT

** Diameter of sewer.

*As-built depth to be determined by Contractor.

Backfill: Jacking and/or receiving pits located beneath future track locations shall be backfilled in accordance with Section 208 (trench backfill) of the Standard Specifications.

Basis of Payment: This work will be paid for at the contract unit price per foot for STORM SEWERS JACKED IN PLACE of the diameter shown on the plans which price shall include the sewer, metal liner, grouting all voids between the sewer and metal liner, all other materials and equipment necessary to install the sewer and pipeline marker signs, and all excavation except excavation in rock.

STORM SEWER, GAS MAIN AND WATER MAIN REMOVAL

Description: This work shall consist of the removal of water mains, gas mains, storm sewers, sanitary sewer or combined sewers in accordance with Section 551 of the Standard Specifications.

Sewers and mains smaller than 12 in. will not be measured for removal.

Basis of Payment: This work, regardless of the type of sewer, gas or water main, will be paid for at the contract unit price per foot for STORM SEWER REMOVAL, of the diameter specified.

STORM SEWER TO BE FILLED

Description: This work shall consist of filling existing 48 in. and 54 in. storm, sanitary or combined sewer to be abandoned, as designated on the plans or as directed by the Engineer, with Controlled Low Strength Material (CLSM) according to Articles 593.02 and 593.03 of the SSRBC and as specified in this special provision.

Materials: CLSM shall meet the requirements of Section 1019 of the SSRBC.

Select rubble shall be pieces of natural rock, broken concrete without protruding metal bars, bricks, or reclaimed asphalt pavement with no expansive aggregate. The pieces shall have a minimum dimension no less than ten (10) times the maximum aggregate size of the CLSM and a maximum dimension no greater than 20 percent of the minimum dimension of the space to be filled. Select rubble shall be free of regulated waste material.

Construction Requirements: The portion of the sewer to be filled shall be inspected to identify connections, locate obstructions, and assess the condition of the pipe prior to CLSM placement. The Engineer shall be notified of any connections that were not identified in the plans to be abandoned, removed, or redirected and reconnected. Irregularities in sewer pipe, obstructions, open joints, or broken pipe shall be documented and the calculated fill volume shall be adjusted to account for the anomalies,

Termini of storm sewers to be filled shall be plugged with Class SI concrete or brick and mortar. The plug shall be adequate to withstand the hydrostatic load created during the filling operation. If the plugs fail during construction, the Contractor shall be responsible for the cost of repairing the plug, and filling the remainder of the pipe.

CLSM shall be placed in a manner that allows all air or water to be displaced as the CLSM fills the pipe and intermediate structures.

The tops of intermediate manholes shall be removed to a depth of 2 ft below finished grade. The structure may be removed to a greater depth, but not deeper than 18 in. above crown of the abandoned sewer. The remaining structure shall be filled with CLSM or select rubble with voids filled with CLSM. After the CLSM has set, the hole formed by removal of the top of the structure shall be backfilled with sand and the sand compacted to 3 in. below finished grade. The upper 3 in. shall be filled with embankment free from debris and clods and stones larger than 2 in. in the largest dimension.

All excess material resulting from filling the sewers and intermediate structures and partial removal of intermediate structures shall be disposed of by the contractor according to Article 202.03 of the SSRBC,

Method of Measurement: STORM SEWER TO BE FILLED shall be measured in place and the volume computed in cubic yards.

Basis of Payment: This work, regardless of the type of sewer, will be paid for at the contract unit price per cubic yard for STORM SEWER TO BE FILLED. The unit price shall include the cost of removal, disposal, and backfill of the tops of intermediate manholes.

SUNSHELTER

Description: This work shall consist of the design, fabrication, storage, delivery and erection of a welded steel, prefabricated sunshelter with roof according to the dimensions shown in the plans. Also included in this work shall be the furnishing and installation of a concrete foundation and miscellaneous items as indicated on the plans.

Materials:

Tube Support and Roof Frame

Structural steel shall conform to the requirements of Section 1006 of the Standard Specifications, ASTM A500, Gr. B square and rectangular tubing, ASTM A36 structural steel, as applicable, unless otherwise shown on the plans or approved by the Engineer. All structural steel field connections shall be bolted with high strength bolts. The high strength bolts shall be mechanically galvanized according to the requirements of Article 1006.08(a) of the Standard Specifications. Structural steel shall be detailed, fabricated, and erected in accordance with the latest edition of the American Institute of Steel Construction (AISC) Specification Manual. All welding is performed by American Welding Society certified welders and conforms to the latest edition of AWS D1.1 or D1.3 as required.

Roofing

The materials shall comply with the applicable portions of the materials section of the Standard Specifications.

The metal roofing shall be 24 Gage and shall be galvanized per ASTM A653 with a G90 min. coating designation. Installing, fastening, trimming, cutting and overlapping the metal roofing shall be according to the manufacturer.

Concrete Foundation

The concrete foundation shall conform to the requirements of Section 878 of the Standard Specifications.

Design: The control panel support and sunshelter shall conform to the clear height, clear width, and configuration shown on the contract plans. The design and detailing shall be completed by the manufacturer. The design shall be according to the International Building Code (IBC).

Prior to beginning construction or fabrication, the Contractor shall submit design calculations and six sets of shop drawings for each sunshelter and concrete foundations to support the sunshelter to the Engineer for review and approval.

Construction: Sunshelter erection procedures shall be according to the manufacturer's instruction.

Basis of Payment: The sunshelter will be paid for at the contract unit price per each for SUNSHELTER which price shall include the concrete foundation.

TEMPORARY CONCRETE BARRIER

Description: This work shall consist of all labor and equipment necessary for the installation of temporary concrete barrier at the locations as shown in the plans. This work shall be completed in accordance with the applicable portions of Section 704 of the IDOT SSRBC and as directed by the Engineer.

This item shall also include any removal and relocation of this barrier required for the different phases of the project as directed by the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price per foot for TEMPORARY CONCRETE BARRIER which price shall include all labor and equipment necessary to install, remove and relocated the barrier as many times as is necessary to complete the project to the satisfaction of the Engineer.

TEMPORARY PAVEMENT MARKING REMOVAL

Description: This work shall be in accordance to Section 783 of the Standard Specifications and will consist of removing temporary pavement marking used for traffic control and protection.

Basis of Payment: This work shall be paid for at the contract unit price per square foot.

TREE REMOVAL, ACRES

Description: This work consists of tree removal according to Section 201 of the SSRBC except that trees that are not identified for removal by the Engineer shall be saved.

The area of tree removal is shown on the plans immediately north of South Grand Avenue. The Engineer will indicate any trees within the plan quantity area that are not to be removed.

Basis of Payment: Measurement and payment of TREE REMOVAL, ACRES shall be according to Articles 201.10 and 201.11 of the SSRBC.

WATER MAIN

Description: This work shall consist of constructing the outlet pipe from the pump station in accordance with Section 561 of the Standard Specifications except as follows:

Pipe shall be AWWA C900, DR18.

Pipe shall be pressure tested at 150 PSI for a period of two hours with a maximum 2 PSI pressure drop. Tracker wire shall be installed and tested for continuity.

Disinfection will not be required.

Basis of Payment: This work will be paid for at the contract unit price per foot for WATER MAIN of the diameter specified.

RAILWAY

ARCHAEOLOGICAL PHASE II SURVEY

Upon commencement of construction activities, the Contractor, working with the project archaeologist, shall remove portions of the existing track within the existing Norfolk Southern (NS) railyard. The Contractor shall coordinate the track removal with the NS so that railroad operations are not impeded. . The portion of this track removal shall begin at Lawrence Avenue and extend south to Clay Street. The track removal shall extend west from the existing Norfolk Southern Railroad right-of-way and include the six easternmost tracks within the railyard. The Contractor shall allow this area to remain open for a period of time sufficient for the project archaeologist to conduct subsurface trenching and subsequent archaeological investigations, if required by the Illinois Historic Preservation Agency. It is estimated that the time needed by the archaeological crew to conduct this work will be approximately two months. The excavated material from the archaeologist/trenching will be deposited adjacent to their trenches, within the same parcel. Upon approval by the archaeologist, the Contractor shall backfill and compact the excavated areas with the same material removed by the archaeologists. The backfilling and compaction shall meet the special provision requirements of Embankment and Subgrade Preparations. The cost of subsurface trenching and archaeological investigation will be paid by the Department. The track removal work will be paid for at the contract unit price per foot for TRACK REMOVAL which shall include removal of the rails, cross ties, tie plates, spikes, joint bars, rail anchors, frogs, switches and appurtenances, and other track material in the areas indicated. Backfilling and compacting the excavated areas will not be paid for separately but will be included in the contract unit price per cubic yard for EARTH EXCAVATION.

BALLAST

Description: This work shall consist of furnishing, and placing ballast to cover the waterproof membrane of each UPRR bridge deck.

General: Work and material shall conform to the requirements for Mainline Ballast in the Norfolk Southern Standard Specifications for Materials and Construction, as presented below:

1. Ballast must originate from an NSRR approved quarry, such as Iron Mountain Trap Rock, in Iron Mountain Lake, Missouri, or National Lime and Stone in Findlay, Ohio.
2. Ballast shall be approved by the Engineer prior to installation.
3. Ballast material type shall be granite meeting the material quality specifications.

Material Quality:

1. Prepared ballast shall be crushed stone composed of hard durable particles, free from objectionable amounts of deleterious substances and conforming to the requirements of this specification.
2. Prepared ballast shall meet the following specifications:

- a. Gradation, as determined using ASTM C 136, using square opening sieves conforming to ASTM E 11. One test shall be performed each 1000 tons or fraction thereof of material loaded for delivery.
 - i. Mainline ballast shall comply with the NS-modified AREMA gradation #3, as shown in Table 1 below.

Table 1: Ballast Gradations

Percent Passing Standard Sieve Size by Weight									
Type	2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	#4	#200
AREMA #3 Mod.	100	95-100	30-65	0-15		0-5			0.5 max

Note: All gradation testing shall be performed according to AASHTO T-27.

- b. Clay lumps and friable material – percentage as determined by ASTM C 142 shall not exceed 0.5%.
 - c. Material finer than #200 sieve – percentage as determined by ASTM C 117 shall not exceed 0.5%.
 - d. Absorption – as determined by ASTM C 127 shall not exceed 1.0%.
 - e. Sodium sulfate soundness – average weighted loss after five (5) cycles shall not exceed 2.5%, as determined by ASTM C 88.
 - f. Resistance to degradation – as determined by ASTM C 535, grading type 2 (Los Angeles Abrasion Test 535-2) shall not result in a wear percentage greater than 27.5% for granite, or 25.0% for limestone.
 - g. Flat and/or elongated particles – as determined by ASTM D 4791-89, using a 3:1 ratio shall not exceed 5.0%.
3. Contractor shall furnish a certification of compliance stating that the material meets or exceeds the requirements of this specification. For sources not currently approved by NSRR, the Contractor shall provide independent certification as required by the Engineer.
 4. Graded aggregates subject to on site stockpiling prior to placement shall be reblended as directed by the Engineer to ensure compliance with the original grading specified.

Delivery:

1. If ballast is specified by the project contract to be furnished by the Contractor:
 - a. Rail Delivery:
 - i. The Contractor shall be responsible for arranging rail delivery and unloading using cars furnished by NSRR.
 - ii. The Contractor is responsible for all freight charges.
 - iii. If direct unloading of ballast is not possible, the Contractor shall be responsible for arranging rail delivery to the nearest available track. The Contractor shall be responsible for prompt unloading of the cars and for the transport of the material to the job site for installation or stockpiling.
 - b. Truck Delivery:
 - i. The Engineer, or person(s) designated by the Engineer, shall collect quarry tickets for each load of ballast delivered to the job site by truck.

2. The Engineer may refuse acceptance, at no cost to the project, if the material being supplied is unsuitable or not in accordance with these specifications.
3. If material is stockpiled, the Contractor shall limit the movement of wheeled or tracked machines over the stockpile.

Installation: Uncompacted ballast shall be placed evenly to completely cover the waterproof membrane at a thickness of 6 in. Placement of material shall be done in a manner that shall not damage or destroy the waterproof membrane.

Basis of Payment: This work shall be paid for at the contract unit price per cubic yard for BALLAST.

CHAIN LINK FENCE (SPECIAL)

Description: This work shall consist of furnishing and constructing chain link fence with a barbed wire top, gates and accessories at the locations shown on the plans or as directed by the Engineer.

General: Except as modified below, the work and materials shall conform to the requirements of Section 664 and Article 1006.27 of the SSRBC. Barbed wire top shall conform to Article 1006.28 of the SSRBC. The materials including all fabric, posts, fasteners, wires, braces, tops, support arms, and 3 rows of barbed wire shall be included in the cost of the work. All labor, materials, and equipment shall be included in the cost of CHAIN LINK FENCE 8' (SPECIAL), and CHAIN LINK GATES (SPECIAL).

Barbed wire support arms shall be pressed steel, cast iron, or cast aluminum alloy fitted with clips or slots for attaching three strands of barbed wire. Arms shall be set on a 45° angle and be capable of supporting a 250 pound load at outer barbed wire connecting point without causing permanent deflection.

Basis of Payment: This work shall be paid for at the contract unit price per foot for CHAIN LINK FENCE (SPECIAL) of the height specified, and at the contract unit price per each for CHAIN LINK GATES (SPECIAL) of the opening sizes and types specified.

EMBANKMENT AND SUBGRADE PREPARATION

Description: This work shall consist of the construction of embankments underneath railroad track by depositing, placing and compacting earth, stone, gravel, or other materials of acceptable quality above the natural ground or other surface and shall consist of preparing the completed or existing earthwork underneath railroad track as an unimproved subgrade prior to constructing the sub-ballast.

General: Except as modified below, the work and materials shall conform to the requirements of Sections 205 and 301 of the SSRBC.

For embankments:

1. All lifts between 0 ft and 3 ft below the top of the subgrade shall be compacted to not less than 100 percent of the standard laboratory density and all lifts more than 3 ft below the top of the subgrade shall be compacted to not less than 95 percent of the standard laboratory density.
2. The moisture content of the soil shall be between 0 and 6 percentage points above the optimum moisture determined according to AASHTO T-99 (Method C).

In locations beneath the sub-ballast:

1. The contractor shall scarify the top 12 in. of subgrade, adjust the moisture content to between 0 and 6 percentage points above the optimum moisture determined according to AASHTO T-99 (Method C), and compact to not less than 100 percent of the standard laboratory density.

Suitable material taken from drilled shafts, drainage structure excavation, or structure excavation may be used for construction of embankment.

Existing ballast and clean sub-ballast material may be used within the core of the embankment only if the coarse material is thoroughly mixed with fine material. The mixed coarse material shall be homogenous and contain at least 35 percent finer than the No. 200 sieve.

Method of Measurement: This work will not be measured for payment.

Basis of Payment: Subgrade preparation, embankment and any additive or water applied will not be paid for directly but shall be considered as included in the various items of excavation, and their construction shall be included in the unit prices for these items.

NS RAIL OPERATIONS

All work by the Contractor shall be performed in accordance with the NS Special Provisions for Protection of Railway Interests. Train movements along the NS track may limit the times that the Contractor may work on NS right-of-way (ROW). The NS yard between Laurel and Cook Streets is no longer active. The Contractor shall schedule his work in coordination with NS operations.

No charge or claims of the Contract against either the Department or the railroad will be allowed for hindrance or delay on account of railway traffic, any work by the railroad or any other delay incident to the necessary or safe maintenance of railway traffic.

NS SPECIAL PROVISION FOR PROTECTION OF RAILWAY INTERESTS

Special Provisions for Protection of Railway Interests

1. AUTHORITY OF RAILROAD ENGINEER AND SPONSOR ENGINEER:

Norfolk Southern Railway Company, hereinafter referred to as "Railroad", and their authorized representative shall have final authority in all matters affecting the safe maintenance of railroad traffic including the adequacy of the foundations and structures supporting the railroad tracks. For Public Projects impacting the Railroad, the Railroad's Public Projects Engineer, hereinafter referred to as "Railroad Engineer", will serve as the authorized representative of the Railroad.

The authorized representative of the Project Sponsor ("Sponsor"), hereinafter referred to as the "Sponsor's Engineer", shall have authority over all other matters as prescribed herein and in the Project Specifications.

The Sponsor's Prime Contractor, hereinafter referred to as "Contractor" shall be responsible for completing any and all work in accordance with the terms prescribed herein and in the Project Specifications. These terms and conditions are subject to change without notice, from time to time in the sole discretion of the Railroad. Contractor must request from Railroad and follow the latest version of these provisions prior to commencing work.

2. NOTICE OF STARTING WORK:

A. The Contractor shall not commence any work on railroad rights-of-way until he has complied with the following conditions:

1. Signed and received a fully executed copy of the required Norfolk Southern Contractor Right of Entry Agreement.
2. Given the Railroad written notice in electronic format to the Railroad Engineer, with copy to the Sponsor's Engineer who has been designated to be in charge of the work, at least ten days in advance of the date he proposes to begin work on Railroad rights-of-way.
3. Obtained written approval from the Railroad of Railroad Protective Liability Insurance coverage as required by paragraph 14 herein. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.
4. Obtained Railroad's Flagging Services as required by paragraph 7 herein.
5. Obtained written authorization from the Railroad to begin work on Railroad's rights-of-way, such authorization to include an outline of specific conditions with which he must comply.
6. Furnished a schedule for all work within the Railroad's rights-of-way as required by paragraph 7.B.1.

B. The Railroad's written authorization to proceed with the work shall include the names, addresses, and telephone numbers of the Railroad's representatives who are to be

notified as hereinafter required. Where more than one representative is designated, the area of responsibility of each representative shall be specified.

3. INTERFERENCE WITH RAILROAD OPERATIONS:

- A. The Contractor shall so arrange and conduct his work that there will be no interference with Railroad's operations, including train, signal, telephone and telegraphic services, or damage to the property of the Railroad or to poles, wires, and other facilities of tenants on the rights-of-way of the Railroad. Whenever work is liable to affect the operations or safety of trains, the method of doing such work shall first be submitted to the Railroad Engineer for approval, but such approval shall not relieve the Contractor from liability. Any work to be performed by the Contractor which requires flagging service or inspection service shall be deferred by the Contractor until the flagging service or inspection service required by the Railroad is available at the job site.
- B. Whenever work within Railroad's rights-of-way is of such a nature that impediment to Railroad's operations such as use of runaround tracks or necessity for reduced speed is unavoidable, the Contractor shall schedule and conduct his operations so that such impediment is reduced to the absolute minimum.
- C. Should conditions arising from, or in connection with the work, require that immediate and unusual provisions be made to protect operations and property of the Railroad, the Contractor shall make such provisions. If in the judgment of the Railroad Engineer, or in his absence, the Railroad's Division Engineer, such provisions is insufficient, either may require or provide such provisions as he deems necessary. In any event, such unusual provisions shall be at the Contractor's expense and without cost to the Railroad or the Sponsor.
- D. "One Call" Services do not locate buried Railroad utilities. The contractor shall contact the Railroad's representative 2 days in advance of work at those places where excavation, pile driving, or heavy loads may damage the Railroad's underground facilities. Upon request from the Contractor or Sponsor, Railroad forces will locate and paint mark or flag the Railroad's underground facilities. The Contractor shall avoid excavation or other disturbances of these facilities. If disturbance or excavation is required near a buried Railroad facility, the contractor shall coordinate with the Railroad to have the facility potholed manually with careful hand excavation. The facility shall be protected by the Contractor during the course of the disturbance under the supervision and direction of the Railroad's representative.

4. TRACK CLEARANCES:

- A. The minimum track clearances to be maintained by the Contractor during construction are shown on the Project Plans. If temporary clearances are not shown on the project plans, the following criteria shall govern the use of falsework and formwork above or adjacent to operated tracks.
 - 1. A minimum vertical clearance of 22'-0" above top of highest rail shall be maintained at all times.
 - 2. A minimum horizontal clearance of 13'-0" from centerline of tangent track or 14'-0" from centerline of curved track shall be maintained at all times. Additional horizontal clearance may be required in special cases to be safe for operating conditions. This additional clearance will be as determined by the Railroad Engineer.

3. All proposed temporary clearances which are less than those listed above must be submitted to Railroad Engineer for approval prior to construction and must also be authorized by the regulatory body of the State if less than the legally prescribed clearances.
 4. The temporary clearance requirements noted above shall also apply to all other physical obstructions including, but not limited to: stockpiled materials, parked equipment, placement or driving of piles, and bracing or other construction supports.
- B. Before undertaking any work within Railroad right-of-way, and before placing any obstruction over any track, the Contractor shall:
1. Notify the Railroad's representative at least 72 hours in advance of the work.
 2. Receive assurance from the Railroad's representative that arrangements have been made for flagging service as may be necessary.
 3. Receive permission from the Railroad's representative to proceed with the work.
 4. Ascertain that the Sponsor's Engineer has received copies of notice to the Railroad and of the Railroad's response thereto.
5. CONSTRUCTION PROCEDURES:
- A. General:
1. Construction work and operations by the Contractor on Railroad property shall be:
 - a. Subject to the inspection and approval of the Railroad Engineer or their designated Construction Engineering Representative.
 - b. In accordance with the Railroad's written outline of specific conditions.
 - c. In accordance with the Railroad's general rules, regulations and requirements including those relating to safety, fall protection and personal protective equipment.
 - d. In accordance with these Special Provisions.
 2. Submittal Requirements
 - a. The Contractor shall submit all construction related correspondence and submittals electronically to the Railroad Engineer.
 - b. The Contractor shall allow for 30 days for the Railroad's review and response.
 - c. All work in the vicinity of the Railroad's property that has the potential to affect the Railroad's train operations or disturb the Railroad's Property must be submitted and approved by the Railroad prior to work being performed.
 - d. All submittals and calculations must be signed and sealed by a registered engineer licensed in the state of the project work.

- e. All submittals shall first be approved by the Sponsor's Engineer and the Railroad Engineer, but such approval shall not relieve the Contractor from liability.
 - f. For all construction projects, the following submittals, but not limited to those listed below, shall be provided for review and approval when applicable:
 - (1) General Means and Methods
 - (2) Ballast Protection
 - (3) Construction Excavation & Shoring
 - (4) Pipe, Culvert, & Tunnel Installations
 - (5) Demolition Procedure
 - (6) Erection & Hoisting Procedure
 - (7) Debris Shielding or Containment
 - (8) Blasting
 - (9) Formwork for the bridge deck, diaphragms, overhang brackets, and protective platforms
 - (10) Bent Cap Falsework. A lift plan will be required if the contractor want to move the falsework over the tracks.
 - g. For Undergrade Bridges (Bridges carrying the Railroad) the following submittals in addition to those listed above shall be provided for review and approval:
 - (1) Shop Drawings
 - (2) Bearing Shop Drawings and Material Certifications
 - (3) Concrete Mix Design
 - (4) Structural Steel, Rebar, and/or Strand Certifications
 - (5) 28 day Cylinder Test for Concrete Strength
 - (6) Waterproofing Material Certification
 - (7) Test Reports for Fracture Critical Members
 - (8) Foundation Construction Reports
- Fabrication may not begin until the Railroad has approved the required shop drawings.
- h. The Contractor shall include in all submissions a detailed narrative indicating the progression of work with the anticipated timeframe to complete each task. Work will not be permitted to commence until the Contractor has provided the Railroad with a satisfactory plan that the project will be undertaken without scheduling, performance or safety related issues. Submission shall also provide a listing of the anticipated equipment to be used, the location of all equipment to be used and insure a contingency plan of action is in place should a primary piece of equipment malfunction.

B. Ballast Protection

- 1. The Contractor shall submit the proposed ballast protection system detailing the specific filter fabric and anchorage system to be used during all construction activities.

2. The ballast protection is to extend 25' beyond the proposed limit of work, be installed at the start of the project and be continuously maintained to prevent all contaminants from entering the ballast section of all tracks for the entire duration of the project.
- C. Excavation:
1. The subgrade of an operated track shall be maintained with edge of berm at least 10'-0" from centerline of track and not more than 24-inches below top of rail. Contractor will not be required to make existing section meet this specification if substandard, in which case existing section will be maintained.
 2. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.
- D. Excavation for Structures and Shoring Protection:
1. The Contractor will be required to take special precaution and care in connection with excavating and shoring pits, and in driving piles or sheeting for footings adjacent to tracks to provide adequate lateral support for the tracks and the loads which they carry, without disturbance of track alignment and surface, and to avoid obstructing track clearances with working equipment, tools or other material.
 2. All plans and calculations for shoring shall be prepared, signed, and sealed by a Registered Professional Engineer licensed in the state of the proposed project, in accordance with Norfolk Southern's Overhead Grade Separation Design Criteria, subsection H.1.6.E-Construction Excavation (Refer to Norfolk Southern Public Projects Manual Appendix H). The Registered Professional Engineer will be responsible for the accuracy for all controlling dimensions as well as the selection of soil design values which will accurately reflect the actual field conditions.
 3. The Contractor shall provide a detailed installation and removal plan of the shoring components. Any component that will be installed via the use of a crane or any other lifting device shall be subject to the guidelines outlined in section 5.G of these provisions.
 4. The Contractor shall be required to survey the track(s) and Railroad embankment and provide a cross section of the proposed excavation in relation to the tracks.
 5. Calculations for the proposed shoring should include deflection calculations. The maximum deflection for excavations within 18'-0" of the centerline of the nearest track shall be 3/8". For all other cases, the max deflection shall not exceed 1/2".
 6. Additionally, the Railroad will require the installation of an OSHA approved handrail and orange construction safety fencing for all excavations of the Railroad right-of-way.
 7. The front face of shoring located to the closest NS track for all shoring set-ups located in Zone 2 as shown on NS Typical Drawing No. 4 – Shoring Requirements (Appendix I) shall remain in place and be cut off 2'-0" below the final ground elevation. The remaining shoring in Zone 2 and all shoring in Zone 1 may be removed and all voids must be backfilled with flowable fill.
- E. Pipe, Culvert, & Tunnel Installations

1. Pipe, Culvert, & Tunnel Installations shall be in accordance with the appropriate Norfolk Southern Design Specification as noted below:
 - a. For Open Cut Method refer to Norfolk Southern Public Projects Manual Appendix H.4.6.
 - b. For Jack and Bore Method refer to Norfolk Southern Public Projects Manual Appendix H.4.7.
 - c. For Tunneling Method refer to Norfolk Southern Public Projects Manual Appendix H.4.8.
2. The installation methods provided are for pipes carrying storm water or open flow run-off. All other closed pipeline systems shall be installed in accordance Norfolk Southern's Pipe and Wire Program and the NSCE-8

F. Demolition Procedures

1. General
 - a. Demolition plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.
 - b. Railroad tracks and other Railroad property must be protected from damage during the procedure.
 - c. A pre-demolition meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the demolition procedure.
 - d. The Railroad Engineer or his designated representative must be present at the site during the entire demolition procedure period.
 - e. Existing, obsolete, bridge piers shall be removed to a sufficient depth below grade to enable restoration of the existing/proposed track ditch, but in no case less than 2'-0" below final grade.
2. Submittal Requirements
 - a. In addition to the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:
 - (1) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or disposal locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.

- (2) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.
- (3) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the existing structure showing complete and sufficient details with supporting data for the demolition the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
- (4) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.
- (5) A complete demolition procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
- (6) Design and supporting calculations for the temporary support of components, including but not limited to the stability of the superstructure during the temporary condition, temporary girder tie-downs and falsework.

3. Overhead Demolition Debris Shield

- a. The demolition debris shield shall be installed prior to the demolition of the bridge deck or other relevant portions of the superstructure over the track area to catch all falling debris.
- b. The demolition debris shield shall provide a minimum vertical clearance as specified in Section 4.A.1 of these provisions or maintain the existing vertical clearance if the existing clearance is less than that specified in Section 4.A.1.
- c. The Contractor shall include the demolition debris shield installation/removal means and methods as part of the proposed Demolition procedure submission.
- d. The Contractor shall submit the demolition debris shield design and supporting calculations for approval by the Railroad Engineer.

- e. The demolition debris shield shall have a minimum design load of 50 pounds per square foot plus the weight of the equipment, debris, personnel, and other loads to be carried.
- f. The Contractor shall include the proposed bridge deck removal procedure in its demolition means and methods and shall verify that the size and quantity of the demolition debris generated by the procedure does not exceed the shield design loads.
- g. The Contractor shall clean the demolition debris shield daily or more frequently as dictated either by the approved design parameters or as directed by the Railroad Engineer.

4. Vertical Demolition Debris Shield

- a. A vertical demolition debris shield may be required for substructure removals in close proximity to the Railroad's track and other facilities, as determined by the Railroad Engineer.

G. Erection & Hoisting Procedures

1. General

- a. Erection plans are required for all spans over the track(s), for all spans adjacent to the track(s), if located on (or partially on) Railroad right-of-way; and in all situations where cranes will be situated on, over, or adjacent to Railroad right-of-way and within a distance of the boom length plus 15'-0" from the centerline of track.
- b. Railroad tracks and other Railroad property must be protected from damage during the erection procedure.
- c. A pre-erection meeting shall be conducted with the Sponsor, the Railroad Engineer or their representative, and the key Contractor's personnel prior to the start of the erection procedure.
- d. The Railroad Engineer or his designated representative must be present at the site during the entire erection procedure period.
- e. For field splices located over Railroad property, a minimum of 50% of the holes for each connection shall be filled with bolts or pins prior to releasing the crane. A minimum of 50% of the holes filled shall be filled with bolts. All bolts must be appropriately tightened. Any changes to previously approved field splice locations must be submitted to the Railroad for review and approval. Refer to Norfolk Southern's Overhead Grade Separation Design Criteria for additional splice details (Norfolk Southern Public Projects Manual Appendix H.1, Section 4.A.3.).

2. Submittal Requirements

- a. In addition the submittal requirements outlined in Section 5.A.2 of these provisions, the Contractor shall submit the following for approval by the Railroad Engineer:
- (1) As-built beam seat elevations - All as-built bridge seats and top of rail elevations shall be furnished to the Railroad Engineer for review and verification at least 30 days in advance of the erection, to ensure that minimum vertical clearances as approved in the plans will be achieved.
 - (2) A plan showing the location of cranes, horizontally and vertically, operating radii, with delivery or staging locations shown. The location of all tracks and other Railroad facilities as well as all obstructions such as wire lines, poles, adjacent structures, etc. must also be shown.
 - (3) Rating sheets showing cranes or lifting devices to be adequate for 150% of the actual weight of the pick, including all rigging components. A complete set of crane charts, including crane, counterweight, and boom nomenclature is to be submitted. Safety factors that may have been "built-in" to the crane charts are not to be considered when determining the 150% factor of safety.
 - (4) Plans and computations showing the weight of the pick must be submitted. Calculations shall be made from plans of the proposed structure showing complete and sufficient details with supporting data for the erection of the structure. If plans do not exist, lifting weights must be calculated from field measurements. The field measurements are to be made under the supervision of the Registered Professional Engineer submitting the procedure and calculations.
 - (5) The Contractor shall provide a sketch of all rigging components from the crane's hook block to the beam. Catalog cuts or information sheets of all rigging components with their lifting capacities shall be provided. All rigging must be adequate for 150% of the actual weight of the pick. Safety factors that may have been "built-in" to the rating charts are not to be considered when determining the 150% factor of safety. All rigging components shall be clearly identified and tagged with their rated lifting capacities. The position of the rigging in the field shall not differ from what is shown on the final plan without prior review from the Sponsor and the Railroad.
 - (6) A complete erection procedure, including the order of lifts, time required for each lift, and any repositioning or re-hitching of the crane or cranes.
 - (7) Design and supporting calculations for the temporary support of components, including but not limited to temporary girder tie-downs and falsework.

H. Blasting:

1. The Contractor shall obtain advance approval of the Railroad Engineer and the Sponsor Engineer for use of explosives on or adjacent to Railroad property. The request for permission to use explosives shall include a detailed blasting plan. If permission for use of explosives is granted, the Contractor will be required to comply with the following:
 - a. Blasting shall be done with light charges under the direct supervision of a responsible officer or employee of the Contractor and a licensed blaster.
 - b. Electric detonating fuses shall not be used because of the possibility of premature explosions resulting from operation of two-way radios.
 - c. No blasting shall be done without the presence of the Railroad Engineer or his authorized representative. At least 72 hours advance notice to the person designated in the Railroad's notice of authorization to proceed (see paragraph 2.B) will be required to arrange for the presence of an authorized Railroad representative and such flagging as the Railroad may require.
 - d. Have at the job site adequate equipment, labor and materials and allow sufficient time to clean up debris resulting from the blasting without delay to trains, as well as correcting at his expense any track misalignment or other damage to Railroad property resulting from the blasting as directed by the Railway's authorized representative. If his actions result in delay of trains, the Contractor shall bear the entire cost thereof.
 - e. The blasting Contractor shall have a copy of the approved blasting plan on hand while on the site.
 - f. Explosive materials or loaded holes shall not be left unattended at the blast site.
 - g. A seismograph shall be placed on the track shoulder adjacent to each blast which will govern the peak particle velocity of two inches per second. Measurement shall also be taken on the ground adjacent to structures as designated by a qualified and independent blasting consultant. The Railroad reserves the option to direct the placement of additional seismographs at structures or other locations of concern, without regard to scaled distance.
 - h. After each blast, the blasting Contractor shall provide a copy of their drill log and blast report, which includes number of holes, depth of holes, number of decks, type and pounds of explosives used per deck.
 - i. The Railroad may require top of rail elevations and track centers taken before, during and after the blasting and excavation operation to check for any track misalignment resulting from the Contractor's activities.

2. The Railroad representative will:
 - a. Determine approximate location of trains and advise the Contractor the appropriate amount of time available for the blasting operation and clean up.
 - b. Have the authority to order discontinuance of blasting if, in his opinion, blasting is too hazardous or is not in accord with these special provisions.
3. The Contractor must hire, at no expense to the Railroad, a qualified and independent blasting consultant to oversee the use of explosives. The blasting consultant will:
 - a. Review the Contractor's proposed drilling and loading patterns, and with the blasting consultant's personnel and instruments, monitor the blasting operations.
 - b. Confirm that the minimum amounts of explosives are used to remove the rock.
 - c. Be empowered to intercede if he concludes that the Contractor's blasting operations are endangering the Railway.
 - d. Submit a letter acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.
 - e. Furnish copies of all vibration readings to the Railroad representative immediately after each blast. The representative will sign and date the seismograph tapes after each shot to verify the readings are for that specific shot.
 - f. Advise the Railroad representative as to the safety of the operation and notify him of any modifications to the blasting operation as the work progresses.
4. The request for permission to use explosives on the Railroad's Right-of-Way shall include a blasting proposal providing the following details:
 - a. A drawing which shows the proposed blasting area, location of nearest hole and distance to Railway structures, all with reference to the centerline of track.
 - b. Hole diameter.
 - c. Hole spacing and pattern.
 - d. Maximum depth of hole.
 - e. Maximum number of decks per hole.
 - f. Maximum pounds of explosives per hole.
 - g. Maximum pounds of explosives per delay.
 - h. Maximum number of holes per detonation.

- i. Type of detonator and explosives to be used. (Electronic detonating devices will not be permitted). Diameter of explosives if different from hole diameter.
 - j. Approximate dates and time of day when the explosives are to be detonated.
 - k. Type of flyrock protection.
 - l. Type and patterns of audible warning and all clear signals to be used before and after each blast.
 - m. A copy of the blasting license and qualifications of the person directly in charge of the blasting operation, including their name, address and telephone number.
 - n. A copy of the Authority's permit granting permission to blast on the site.
 - o. A letter from the blasting consultant acknowledging that he has been engaged to oversee the entire blasting operation and that he approves of the blasting plan.
 - p. In addition to the insurance requirements outlined in Paragraph 14 of these Provisions, A certificate of insurance from the Contractor's insurer stating the amount of coverage for XCU (Explosive Collapse and Underground Hazard) insurance and that XCU Insurance is in force for this project.
 - q. A copy of the borings and Geotechnical information or report.
- I. Track Monitoring
- 1. At the direction of the Railroad Engineer, any activity that has the potential to disturb the Railroad track structure may require the Contractor to submit a detailed track monitoring program for approval by the Railroad Engineer.
 - 2. The program shall specify the survey locations, the distance between the location points, and frequency of monitoring before, during, and after construction. Railroad reserves the right to modify the survey locations and monitoring frequency as necessary during the project.
 - 3. The survey data shall be collected in accordance with the approved frequency and immediately furnished to the Railroad Engineer for analysis.
 - 4. If any movement has occurred as determined by the Railroad Engineer, the Railroad will be immediately notified. Railroad, at its sole discretion, shall have the right to immediately require all Contractor operations to be ceased and determine what corrective action is required. Any corrective action required by the Railroad or performed by the Railroad including the monitoring of corrective action of the Contractor will be at project expense.
- J. Maintenance of Railroad Facilities:
- 1. The Contractor will be required to maintain all ditches and drainage structures free of silt or other obstructions which may result from his operations and provide and maintain any erosion control measures as required. The Contractor will promptly

repair eroded areas within Railroad rights-of-way and repair any other damage to the property of the Railroad or its tenants.

2. If, in the course of construction, it may be necessary to block a ditch, pipe or other drainage facility, temporary pipes, ditches or other drainage facilities shall be installed to maintain adequate drainage, as approved by the Railroad Engineer. Upon completion of the work, the temporary facilities shall be removed and the permanent facilities restored.
3. All such maintenance and repair of damages due to the Contractor's operations shall be done at the Contractor's expense.

K. Storage of Materials and Equipment:

1. Materials and equipment shall not be stored where they will interfere with Railroad operations, nor on the rights-of-way of the Railroad without first having obtained permission from the Railroad Engineer, and such permission will be with the understanding that the Railroad will not be liable for damage to such material and equipment from any cause and that the Railroad Engineer may move or require the Contractor to move, at the Contractor's expense, such material and equipment.
2. All grading or construction machinery that is left parked near the track unattended by a watchman shall be effectively immobilized so that it cannot be moved by unauthorized persons. The Contractor shall protect, defend, indemnify and save Railroad, and any associated, controlled or affiliated corporation, harmless from and against all losses, costs, expenses, claim or liability for loss or damage to property or the loss of life or personal injury, arising out of or incident to the Contractor's failure to immobilize grading or construction machinery.

L. Cleanup:

1. Upon completion of the work, the Contractor shall remove from within the limits of the Railroad rights-of-way, all machinery, equipment, surplus materials, falsework, rubbish or temporary buildings of the Contractor, and leave said rights-of-way in a neat condition satisfactory to the Railroad Engineer or his authorized representative.

6. DAMAGES:

- A. The Contractor shall assume all liability for any and all damages to his work, employees, servants, equipment and materials caused by Railroad traffic.
- B. Any cost incurred by the Railroad for repairing damages to its property or to property of its tenants, caused by or resulting from the operations of the Contractor, shall be paid directly to the Railroad by the Contractor.

7. FLAGGING SERVICES:

A. Requirements:

1. Flagging services will not be provided until the Contractor's insurance has been reviewed & approved by the Railroad.

2. Under the terms of the agreement between the Sponsor and the Railroad, the Railroad has sole authority to determine the need for flagging required to protect its operations. In general, the requirements of such services will be whenever the Contractor's personnel or equipment are or are likely to be, working on the Railroad's right-of-way, or across, over, adjacent to, or under a track, or when such work has disturbed or is likely to disturb a Railroad structure or the Railroad roadbed or surface and alignment of any track to such extent that the movement of trains must be controlled by flagging.
 3. Normally, the Railroad will assign one flagman to a project; but in some cases, more than one may be necessary, such as yard limits where three (3) flagmen may be required. However, if the Contractor works within distances that violate instructions given by the Railroad's authorized representative or performs work that has not been scheduled with the Railroad's authorized representative, a flagman or flagmen may be required full time until the project has been completed.
 4. For Projects exceeding 30 days of construction, Contractor shall provide the flagmen a small work area with a desk/counter and chair within the field/site trailer, including the use of bathroom facilities, where the flagman can check in/out with the Project, as well as to the flagman's home terminal. The work area should provide access to two (2) electrical outlets for recharging radio(s), and a laptop computer; and have the ability to print off needed documentation and orders as needed at the field/site trailer. This should aid in maximizing the flagman's time and efficiency on the Project.
- B. Scheduling and Notification:
1. The Contractor's work requiring Railroad flagging should be scheduled to limit the presence of a flagman at the site to a maximum of 50 hours per week. The Contractor shall receive Railroad approval of work schedules requiring a flagman's presence in excess of 40 hours per week.
 2. Not later than the time that approval is initially requested to begin work on Railroad right-of-way, Contractor shall furnish to the Railroad and the Sponsor a schedule for all work required to complete the portion of the project within Railroad right-of-way and arrange for a job site meeting between the Contractor, the Sponsor, and the Railroad's authorized representative. Flagman or Flagmen may not be provided until the job site meeting has been conducted and the Contractor's work scheduled.
 3. The Contractor will be required to give the Railroad representative at least 10 working days of advance written notice of intent to begin work within Railroad right-of-way in accordance with this special provision. Once begun, when such work is then suspended at any time, or for any reason, the Contractor will be required to give the Railroad representative at least 3 working days of advance notice before resuming work on Railroad right-of-way. Such notices shall include sufficient details of the proposed work to enable the Railroad representative to determine if flagging will be required. If such notice is in writing, the Contractor shall furnish the Engineer a copy; if notice is given verbally, it shall be confirmed in writing with copy to the Engineer. If flagging is required, no work shall be undertaken until the flagman, or flagmen are present at the job site. It may take up to 30 days to obtain flagging initially from the Railroad. When flagging begins, the flagman is usually assigned by the Railroad to work at the project site on a continual basis until no longer

needed and cannot be called for on a spot basis. If flagging becomes unnecessary and is suspended, it may take up to 30 days to again obtain from the Railroad. Due to Railroad labor agreements, it is necessary to give 5 working days notice before flagging service may be discontinued and responsibility for payment stopped.

4. If, after the flagman is assigned to the project site, an emergency arises that requires the flagman's presence elsewhere, then the Contractor shall delay work on Railroad right-of-way until such time as the flagman is again available. Any additional costs resulting from such delay shall be borne by the Contractor and not the Sponsor or Railroad.

C. Payment:

1. The Sponsor will be responsible for paying the Railroad directly for any and all costs of flagging which may be required to accomplish the construction.
2. The estimated cost of flagging is the current rate per day based on a 10-hour work day. This cost includes the base pay for the flagman, overhead, and includes a per diem charge for travel expenses, meals and lodging. The charge to the Sponsor by the Railroad will be the actual cost based on the rate of pay for the Railroad's employees who are available for flagging service at the time the service is required.
3. Work by a flagman in excess of 8 hours per day or 40 hours per week, but not more than 12 hours a day will result in overtime pay at 1 and 1/2 times the appropriate rate. Work by a flagman in excess of 12 hours per day will result in overtime at 2 times the appropriate rate. If work is performed on a holiday, the flagging rate is 2 and 1/2 times the normal rate.
4. Railroad work involved in preparing and handling bills will also be charged to the Sponsor. Charges to the Sponsor by the Railroad shall be in accordance with applicable provisions of Subchapter B, Part 140, Subpart I and Subchapter G, Part 646, Subpart B of the Federal-Aid Policy Guide issued by the Federal Highway Administration on December 9, 1991, including all current amendments. Flagging costs are subject to change. The above estimates of flagging costs are provided for information only and are not binding in any way.

D. Verification:

1. Railroad's flagman will electronically enter flagging time via Railroad's electronic billing system. Any complaints concerning flagging must be resolved in a timely manner. If the need for flagging is questioned, please contact the Railroad Engineer. All verbal complaints will be confirmed in writing by the Contractor within 5 working days with a copy to the Sponsor's Engineer. Address all written correspondence electronically to Railroad Engineer.
2. The Railroad flagman assigned to the project will be responsible for notifying the Sponsor Engineer upon arrival at the job site on the first day (or as soon thereafter as possible) that flagging services begin and on the last day that he performs such services for each separate period that services are provided. The Sponsor's Engineer will document such notification in the project records. When requested, the Sponsor's Engineer will also sign the flagman's diary showing daily time spent and activity at the project site.

8. HAUL ACROSS RAILROAD TRACK:

- A. Where the plans show or imply that materials of any nature must be hauled across Railroad's track, unless the plans clearly show that the Sponsor has included arrangements for such haul in its agreement with the Railroad, the Contractor will be required to make all necessary arrangements with the Railroad regarding means of transporting such materials across the Railroad's track. The Contractor or Sponsor will be required to bear all costs incidental to such crossings whether services are performed by his own forces or by Railroad personnel.
- B. No crossing may be established for use of the Contractor for transporting materials or equipment across the tracks of the Railroad unless specific authority for its installation, maintenance, necessary watching and flagging thereof and removal, until a temporary private crossing agreement has been executed between the Contractor and Railroad. The approval process for an agreement normally takes 90 days.

9. WORK FOR THE BENEFIT OF THE CONTRACTOR:

- A. All temporary or permanent changes in wire lines or other facilities which are considered necessary to the project are shown on the plans; included in the force account agreement between the Sponsor and the Railroad or will be covered by appropriate revisions to same which will be initiated and approved by the Sponsor and/or the Railroad.
- B. Should the Contractor desire any changes in addition to the above, then he shall make separate arrangements with the Railroad for same to be accomplished at the Contractor's expense.

10. COOPERATION AND DELAYS:

- A. It shall be the Contractor's responsibility to arrange a schedule with the Railroad for accomplishing stage construction involving work by the Railroad or tenants of the Railroad. In arranging his schedule he shall ascertain, from the Railroad, the lead time required for assembling crews and materials and shall make due allowance therefore.
- B. No charge or claim of the Contractor against either the Sponsor or the Railroad will be allowed for hindrance or delay on account of railroad traffic; any work done by the Railroad or other delay incident to or necessary for safe maintenance of railroad traffic or for any delays due to compliance with these special provisions.

11. TRAINMAN'S WALKWAYS:

- A. Along the outer side of each exterior track of multiple operated track, and on each side of single operated track, an unobstructed continuous space suitable for trainman's use in walking along trains, extending to a line not less than 10 feet from centerline of track, shall be maintained. Any temporary impediments to walkways and track drainage encroachments or obstructions allowed during work hours while Railroad's protective service is provided shall be removed before the close of each work day. If there is any excavation near the walkway, a handrail, with 10'-0" minimum clearance from centerline of track, shall be placed and must conform to AREMA and/or FRA standards.

12. GUIDELINES FOR PERSONNEL ON RAILROAD RIGHT-OF-WAY:

- A. The Contractor and/or the Sponsor's personnel authorized to perform work on Railroad's property as specified in Section 2 above are not required to complete Norfolk Southern Roadway

Worker Protection Training: However the Contractor and the Sponsor's personnel must be familiar with Norfolk Southern's standard operating rules and guidelines, should conduct themselves accordingly, and may be removed from the property for failure to follow these guidelines.

- B. All persons shall wear hard hats. Appropriate eye and hearing protection must be used. Working in shorts is prohibited. Shirts must cover shoulders, back and abdomen. Working in tennis or jogging shoes, sandals, boots with high heels, cowboy and other slip-on type boots is prohibited. Hard-sole, lace-up footwear, zippered boots or boots cinched up with straps which fit snugly about the ankle are adequate. Wearing of safety boots is strongly recommended. In the vicinity of at-grade crossings, it is strongly recommended that reflective vests be worn.
- C. No one is allowed within 25' of the centerline of track without specific authorization from the flagman.
- D. All persons working near track while train is passing are to lookout for dragging bands, chains and protruding or shifted cargo.
- E. No one is allowed to cross tracks without specific authorization from the flagman.
- F. All welders and cutting torches working within 25' of track must stop when train is passing.
- G. No steel tape or chain will be allowed to cross or touch rails without permission from the Railroad.

13. GUIDELINES FOR EQUIPMENT ON RAILROAD RIGHT-OF-WAY:

- A. No crane or boom equipment will be allowed to set up to work or park within boom distance plus 15' of centerline of track without specific permission from Railroad official and flagman.
- B. No crane or boom equipment will be allowed to foul track or lift a load over the track without flag protection and track time.
- C. All employees will stay with their machines when crane or boom equipment is pointed toward track.
- D. All cranes and boom equipment under load will stop work while train is passing (including pile driving).
- E. Swinging loads must be secured to prevent movement while train is passing.
- F. No loads will be suspended above a moving train.
- G. No equipment will be allowed within 25' of centerline of track without specific authorization of the flagman.
- H. Trucks, tractors or any equipment will not touch ballast line without specific permission from Railroad official and flagman. Orange construction fencing may be required as directed.
- I. No equipment or load movement within 25' or above a standing train or Railroad equipment without specific authorization of the flagman.

- J. All operating equipment within 25' of track must halt operations when a train is passing. All other operating equipment may be halted by the flagman if the flagman views the operation to be dangerous to the passing train.
- K. All equipment, loads and cables are prohibited from touching rails.
- L. While clearing and grubbing, no vegetation will be removed from Railroad embankment with heavy equipment without specific permission from the Railroad Engineer and flagman.
- M. No equipment or materials will be parked or stored on Railroad's property unless specific authorization is granted from the Railroad Engineer.
- N. All unattended equipment that is left parked on Railroad property shall be effectively immobilized so that it cannot be moved by unauthorized persons.
- O. All cranes and boom equipment will be turned away from track after each work day or whenever unattended by an operator.
- P. Prior to performing any crane operations, the Contractor shall establish a single point of contact for the Railroad flagman to remain in communication with at all times. Person must also be in direct contact with the individual(s) directing the crane operation(s).

14. INSURANCE:

- A. In addition to any other forms of insurance or bonds required under the terms of the contract and specifications, the Prime Contractor will be required to carry insurance of the following kinds and amounts:
 - 1. a. Commercial General Liability Insurance having a combined single limit of not less than \$2,000,000 per occurrence for all loss, damage, cost and expense, including attorneys' fees, arising out of bodily injury liability and property damage liability during the policy period. Said policy shall include explosion, collapse, and underground hazard (XCU) coverage, shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured, and shall include a severability of interests provision.
 - b. Automobile Liability Insurance with a combined single limit of not less than \$1,000,000 each occurrence for injury to or death of persons and damage to or loss or destruction of property. Said policy or policies shall be endorsed to name Railroad specified in item A.2.c. below both as the certificate holder and as an additional insured and shall include a severability of interests provision.
- 2. Railroad Protective Liability Insurance having a combined single limit of not less than \$2,000,000 each occurrence and \$6,000,000 in the aggregate applying separately to each annual period. If the project involves track over which passenger trains operate, the insurance limits required are not less than a combined single limit of \$5,000,000 each occurrence and \$10,000,000 in the aggregate applying separately to each annual period. Said policy shall provide coverage for all loss, damage or expense arising from bodily injury and property damage liability, and physical damage to property attributed to acts or omissions at the job site.

The standards for the Railroad Protective Liability Insurance are as follows:

- a. The insurer must be rated A- or better by A.M. Best Company, Inc.
NOTE: NS does not accept from insurers Chartis (AIG or Affiliated Company including Lexington Insurance Company), Hudson Group or Liberty or Affiliated Company, American Contractors Insurance Company and Erie Insurance Company including Erie Insurance Exchange and Erie Indemnity Company.
- b. The policy must be written using one of the following combinations of Insurance Services Office ("ISO") Railroad Protective Liability Insurance Form Numbers:
 - (1) CG 00 35 01 96 and CG 28 31 10 93; or
 - (2) CG 00 35 07 98 and CG 28 31 07 98; or
 - (3) CG 00 35 10 01; or
 - (4) CG 00 35 12 04; or
 - (5) CG 00 35 12 07; or
 - (6) CG 00 35 04 13.
- c. The named insured shall read:

Norfolk Southern Corporation and its subsidiaries
Three Commercial Place
Norfolk, Virginia 23510-2191
Attn: S. W. Dickerson Risk Management

(NOTE: Railroad does not share coverage on RRPL with any other entity on this policy)
- d. The description of operations must appear on the Declarations, must match the project description in this agreement, and must include the appropriate Sponsor project and contract identification numbers.
- e. The job location must appear on the Declarations and must include the city, state, and appropriate highway name/number. **NOTE: Do not include any references to milepost, valuation station, or mile marker on the insurance policy.**
- f. The name and address of the prime Contractor must appear on the Declarations.
- g. The name and address of the Sponsor must be identified on the Declarations as the "Involved Governmental Authority or Other Contracting Party."
- h. Endorsements/forms that are **required** are:
 - (1) Physical Damage to Property Amendment
 - (2) Terrorism Risk Insurance Act (TRIA) coverage must be included
- i. Other endorsements/forms that will be accepted are:

- (1) Broad Form Nuclear Exclusion – Form IL 00 21
 - (2) 30-day Advance Notice of Non-renewal or cancellation
 - (3) Required State Cancellation Endorsement
 - (4) Quick Reference or Index Form CL/IL 240
- j. Endorsements/forms that are NOT acceptable are:
- (1) Any Pollution Exclusion Endorsement except CG 28 31
 - (2) Any Punitive or Exemplary Damages Exclusion
 - (3) Known injury or Damage Exclusion form CG 00 59
 - (4) Any Common Policy Conditions form
 - (5) An Endorsement that limits or excludes Professional Liability coverage
 - (6) A Non-Cumulation of Liability or Pyramiding of Limits Endorsement
 - (7) An Endorsement that excludes TRIA coverage
 - (8) A Sole Agent Endorsement
 - (9) Any type of deductible endorsement or amendment
 - (10) Any other endorsement/form not specifically authorized in item no. 2.h above.
- B. If any part of the work is sublet, similar insurance, and evidence thereof as specified in A.1 above, shall be provided by or on behalf of the subcontractor to cover its operations on Railroad's right of way.
- C. All insurance required under the preceding subsection A shall be underwritten by insurers and be of such form and content, as may be acceptable to the Company. Prior to entry on Railroad right-of-way, the original Railroad Protective Liability Insurance Policy shall be submitted by the Prime Contractor to the Department at the address below for its review and transmittal to the Railroad. In addition, certificates of insurance evidencing the Prime Contractor's and any subcontractors' Commercial General Liability Insurance shall be issued to the Railroad and the Department at the addresses below, and forwarded to the Department for its review and transmittal to the Railroad. The certificates of insurance shall state that the insurance coverage will not be suspended, voided, canceled, or reduced in coverage or limits without (30) days advance written notice to Railroad and the Department. No work will be permitted by Railroad on its right-of-way until it has reviewed and approved the evidence of insurance required herein.
- SPONSOR:
- RAILROAD:
Risk Management
Norfolk Southern Railway Company
Three Commercial Place
Norfolk, Virginia 23510-2191
- D. The insurance required herein shall in no way serve to limit the liability of Sponsor or its Contractors under the terms of this agreement.
- E. Insurance Submission Procedures
1. Railroad will only accept initial insurance submissions via US Mail or Overnight carrier to the address noted in C above. Railroad will NOT accept initial insurance submissions via email or faxes. **Please provide point of contact information with the submission including a phone number and email address.**

2. Railroad requires the following two (2) forms of insurance in the initial insurance submission to be submitted under a cover letter providing details of the project and contact information:
 - a. The full original or certified true countersigned copy of the railroad protective liability insurance policy in its entirety inclusive of all declarations, schedule of forms and endorsements along with the policy forms and endorsements.
 - b. The Contractor's commercial general, automobile, and workers' compensation liability insurance certificate of liability insurance evidencing a combined single limit of a minimum of \$2M per occurrence of general and \$1M per occurrence of automobile liability insurance naming Norfolk Southern Railway Company, Three Commercial Place, Norfolk, VA 23510 as the certificate holder and as an additional insured on both the general and automobile liability insurance policy.
3. It should be noted that the Railroad does not accept notation of Railroad Protective insurance on a certificate of liability insurance form or Binders as Railroad must have the full original countersigned policy. Further, please note that mere receipt of the policy is not the only issue but review for compliance. Due to the number of projects system-wide, it typically takes a minimum of 30-45 days for the Railroad to review.

15. FAILURE TO COMPLY:

- A. In the event the Contractor violates or fails to comply with any of the requirements of these Special Provisions:
 1. The Railroad Engineer may require that the Contractor vacate Railroad property.
 2. The Sponsor's Engineer may withhold all monies due the Contractor on monthly statements.
- B. Any such orders shall remain in effect until the Contractor has remedied the situation to the satisfaction of the Railroad Engineer and the Sponsor's Engineer.

16. PAYMENT FOR COST OF COMPLIANCE:

- A. No separate payment will be made for any extra cost incurred on account of compliance with these special provisions. All such costs shall be included in prices bid for other items of the work as specified in the payment items.

17. PROJECT INFORMATION

- A. Date: _____
- B. NS File No.: _____
- C. NS Milepost: _____
- D. Sponsor's Project No.: _____

PIPE DRAINS (SPECIAL)

Description: This work shall consist of constructing pipe drains of the required diameter according to Sections 601 of the SSRBC at locations shown on the plans or as directed by the Engineer, except that the materials shall be as specified on the detail in the plans.

General:

- A. Pipe shall be limited to Smooth Steel Pipe.
- B. The steel pipe shall conform to ASTM Specifications A 139 Grade B (No Hydro). The minimum yield strength of this pipe shall be 35,000 psi. The minimum wall thickness is as follows:

Normal Size (Inches)	Minimum Wall Thickness (Inches)
12	0.250
15	0.3125
18	0.3125

- C. The pipe shall be coated externally with coal tar epoxy or bituminous asphalt. The pipe shall be shop cut with ends square with centerline, leveled and welded so that the entire length of the pipe shall be straight and true. Weld seams in the field shall be field applied with coal tar epoxy or bituminous asphalt.

Pipe Connections

Smooth steel pipe and pipe connected by welding using a full depth, single “V” groove butt weld. Welding shall be performed by skilled welders, welding operators, and tackers who have had adequate experience in the type of materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 by an independent local, approved testing agency not more than 6 months prior to commencing work on the pipe. Machines and electrodes similar to those used in the work shall be used in qualifications test. The Contractor shall be responsible for all material and bear the expense of qualifying welders.

Trenches for pipe drains (special) shall be backfilled with sub-ballast or with material meeting the requirements of Section 208 of the SSRBC.

At locations noted on the plans, the pipe drains will be constructed in stages. The pipe connection between stages shall be field welded.

Basis of Payment: This work including all elbows, tees, wyes, connections and backfill shall be paid for at the contract unit price per foot for PIPE DRAINS (SPECIAL) of the diameter specified.

PIPE UNDERDRAINS 6" (MODIFIED)

Description: This work shall consist of constructing a perforated pipe encased in fabric, installed in a trench backfilled with fine aggregated, of the required diameter within a trench filled with aggregate according to Section 601 of the SSRBC at locations shown on the plans or as directed by the Engineer. Work shall also consist of removal and proper disposal of the underdrain pipes and plugging connections to structures in the construction stage indicated on the plans.

General: The materials shown in the plans, including all elbows, tees, wyes, backfill, and connections to structures and pipe drain outlets shall be included in the cost for the work. All excavation, labor, equipment and materials necessary for completing the work including removing the temporary underdrains and plugging the openings shall be included in the cost for PIPE UNDERDRAIN 6" (MODIFIED).

Pipe drain trench shall be backfilled and compacted immediately after installing pipe drain. This work shall be completed during available track time. Open trenches will not be allowed when there is a train operating in the work area.

Basis of Payment: This work shall be paid for at the contract unit price per foot for PIPE UNDERDRAINS 6" (MODIFIED).

PIPE UNDERDRAINS, TYPE 2

Description: This work shall consist of constructing pipe underdrains of the required diameter within a trench filled with aggregate according to Section 601 of the SSRBC and the details included in the plans at locations shown on the plans or as directed by the Engineer.

General: The materials shown in the plans, including all cleanouts, cleanout covers, elbows, tees, wyes, geotechnical fabric, and backfill shall be included in the cost for the work. All excavation, labor, equipment and materials necessary for completing the work shall be included in the cost for PIPE UNDERDRAINS, TYPE 2 of the diameter specified.

Method of Measurement: Measurement of payment shall be in accordance with paragraph 601.07. The vertical segments of pipe underdrains will be measured for payment along with the horizontal segments.

Basis of Payment: This work shall be paid for at the contract unit price per foot for PIPE UNDERDRAINS, TYPE 2 of the diameter specified.

PIPE UNDERDRAIN (SPECIAL)

Description: This work shall be in accordance with Section 601 of the Standard Specifications. Pipe underdrains (special) shall be Type 2. The pipe underdrain material shall be perforated composite sewer pipe conforming to ASTM D2680 with solvent cemented joints in accordance

with ASTM D2235, D2564 and D3138, flexible elastomeric seals conforming to ASTM D3212 and F477 or gasketed bell coupling connections. Minimum pipe stiffness when measured in accordance with ASTM D2412 shall be 200 PSI.

Pipe underdrains shall have four rows of perforations at 2 in. centers.

Basis of Payment: This work will be paid for at the contract unit price per lineal foot per PIPE UNDERDRAIN (SPECIAL) of the diameter specified.

SUB-BALLAST

Description: This work shall consist of furnishing, placing, and compacting sub-ballast on the prepared subgrade at locations shown on the plans.

General: Work and material shall conform to the requirements of Section 311 of the SSRBC for Subbase Granular Material, Type A with the following modifications:

1. The maximum lift thickness shall be 6 in.
2. The compaction requirement shall be not less than 100 percent of the standard laboratory density.
3. The material shall be crushed stone in accordance with Article 1004.04 of the SSRBC.
4. The gradation shall be CA-6 in accordance with Article 1004.04 of the SSRBC, except that the gradation of the No. 200 sieve shall be 3-8 percent.

Submittals: Submittals shall be made in accordance with Section 106 of the SSRBC and the Bureau of Materials and Physical Research's Policy Memorandum "Aggregate Gradation Control System". Weekly stockpile/loadout tests shall be submitted to the Engineer.

Basis of Payment: This work shall be paid for at the contract unit price per cubic yard for SUB-BALLAST.

TRACK REMOVAL

Description: The Contractor will be required to remove and dispose of the existing track or remove and stockpile the existing track. Once the Norfolk Southern (NS) has indicated whether the existing track shall be disposed of or stockpiled, the Engineer will provide direction to the Contractor. The Contractor shall not dispose of or stockpile the track without permission of the Engineer.

Track material includes rails, cross ties, tie plates, spikes, joint bars, rail anchors, frogs, switches and appurtenances, and other track material. No cutting of rails will be allowed unless approved by

the Engineer. Contractor will be responsible for shaping, smoothing, and compacting the roadbed after removal of track or turnouts. The roadbed shall be free of ruts and depressions and shaped to allow for proper drainage. Cost for this work shall be included in the cost of TRACK REMOVAL. Removal of pavement and sidewalk within tie width shall be included in the cost of TRACK REMOVAL.

Track Removal and Disposal: Track material shall be removed and disposed of during the proper stage of construction. Contractor shall coordinate the limits and sequencing of all track material removal with NS during each stage of construction so that NS operations are not impeded.

Track material within the designated limits of removal, as shown on the plans or modified by the Engineer, shall become the property of the Contractor and shall be removed from the project area and salvaged or properly disposed of.

Track Removal and Stockpiling: Track material shall be removed and stockpiled during the proper stage of construction. Contractor shall coordinate the limits and sequencing of all track material removal and stockpiling with NS during each stage of construction so that NS operations are not impeded.

Track material within the designated limits of removal, as shown on the plans or modified by the Engineer, is the property of the NS and shall be removed and stockpiled at the following locations. Prior to embankment and drainage structure/pipe construction in Stage 1, all rail shall be stockpiled between the toe of embankment slope at Stage 1 and 10ft from the centerline of existing NS mainline track within the existing NS railyard between Cook Street and South Grand Avenue. All other track material shall be stockpiled in an orderly manor at the City of Springfield property located at 830 E. Ash Street. This City property has been previously utilized for earthwork staging.

All hardware shall be removed from the cross ties and stockpiled. Cross ties that have been determined to be unsalvageable by the Engineer shall be removed and disposed of according to the track removal and disposal portion of this Special Provision and not stockpiled. Removal and disposal of these ties will not be measured for payment but shall be included in the cost of TRACK REMOVAL.

After Stage 1 construction is complete, if the NS has not removed the stockpiled rail, the Contractor will be required to remove and dispose of the rail. Cost for this work shall be included in the cost of TRACK REMOVAL. The Contractor shall only remove and dispose of the rail from the stockpile site if directed by the Engineer.

General: This work will include all labor, materials and equipment required to dismantle, remove and dispose or remove and stockpile track and turnouts from locations shown on the plans, or as directed by the Engineer.

Basis of Payment: Track removal and disposal or track removal and stockpiling will be paid for at the contract unit price per foot for TRACK REMOVAL.

WOVEN WIRE FENCE, 4'

This work shall be in accordance with Section 665 of the Standard Specifications except that the barbed wire shall be omitted, and the design number of the fence fabric shall be either 1047-6-11 or 1047-6-12 ½. This work will be paid for at the contract unit price per foot for WOVEN WIRE FENCE, 4'.

WOVEN WIRE FENCE AND GATES

Description: This work shall consist of installing woven wire fence and gates according to Section 665 of the SSRBC at locations shown on the plans or as directed by the Engineer. The fence and gates shall be installed at the beginning at the project prior to the initial grading of railway embankment. The Contractor shall maintain and avoid damaging the fence and gates during construction. Any maintenance required or damage to the fence or gates by the Contractor during construction shall be repaired to the satisfaction of the Engineer at no additional cost to the contract.

STRUCTURAL

CONCRETE STRUCTURES

General: Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 503 – Concrete Structures, shall apply to all work under this section.

Material Requirements: The minimum concrete compressive strength at fourteen (14) days shall be 4,000 psi.

Fly Ash, Silicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020 – Portland Cement Concrete, not in lieu of cement.

Self-Consolidating concrete shall be used for the retaining wall cast-in-place concrete facing that utilize form liners. Self-Consolidating admixtures shall be according to Section 1021.05 of the Standard Specifications.

CONCRETE STRUCTURES (RETAINING WALL)

General: Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 522 – Concrete Structures Retaining Walls, shall apply to all work under this section.

Material Requirements: The minimum concrete compressive strength at fourteen (14) days shall be 4,000 psi.

Fly Ash, Silicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020 – Portland Cement Concrete, not in lieu of cement.

Self-Consolidating concrete shall be used for the retaining wall cast-in-place concrete facing that utilize form liners. Self-Consolidating admixtures shall be according to Section 1021.05 of the Standard Specifications.

CONCRETE SUPERSTRUCTURE

General: Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 503 – Concrete Structures and GBSP #78 Bridge Deck Construction, shall apply to all work under this section.

Material Requirements: Fly Ash, Silicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in

the Standard Specifications for Road and Bridge Construction, Section 1020 – Portland Cement Concrete, not in lieu of cement.

Initial Finishing: Use of a finishing machine may not be practical due to the transverse deck profile. At the Contractor's option, a vibrating screed may be used in lieu of a finishing machine for superstructures with a pour width less than or equal to 24 ft. After the concrete is placed and consolidated, it shall be struck off with a vibrating screed. The vibrating screed shall be of a type approved by the Engineer. A slight excess of concrete shall be kept in front of the cutting edge at all times during the striking off operation. After screeding, the entire surface shall be finished with hand-operated, long-handled floats having blades not less than 10 ft (3 m) in length and 6 in. (150 mm) in width. Decks so finished need not be straightedge tested as specified in 503.16(a)(2). The plans indicate locations of optional transverse construction joints that will allow for the bridge deck to be transversely screeded. These optional joints are only allowed if the bridge deck is transversely screeded with a vibrating screed. The Contractor may propose a different option to initial finish/strike off the bridge deck but it must be approved by the Engineer.

CONCRETE SURFACE COLOR TREATMENT

Description: This work shall consist of furnishing all labor, materials, and equipment for the application of a concrete surface color treatment and water based polyurethane concrete sealer to the locations shown on the plans.

General: The concrete surface color treatment shall be a two-part, colored cementitious coating. This coating shall be opaque, high-strength, extremely UV-resistant and suitable to apply to vertical surfaces. BRICKFORM Cem-Coat shall be used for the Concrete Surface Color Treatment.

The protection system shall be a water-based polyurethane concrete sealer that forms a high-solids coating with a clear matte finish, provides a chemical-resistant barrier coating that seals and protects the concrete under heavy use conditions, and shall be completed in accordance with this specification, manufacturer's recommendations and applicable sections of Section 587 of the Standard Specifications for Road and Bridge Construction. BRICKFORM UreMax WB shall be used for the Protection System.

Construction Requirements:

Surface Color Treatment: The preparation of the concrete surfaces and application of the concrete coating shall be done in such a manner as to not damage the concrete and according to the manufacturer's written instructions.

The color of the concrete coating should be Blue, Munsell No. 10B 3/6 or 'Stone Gray' to the locations shown on the plans. Submit samples to the Engineer, for approval, on actual substrate in the blue and gray colors to verify preliminary selections made under sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Store the coating materials not in use in tightly covered containers in a well-ventilated area at a

minimum ambient temperature of 45 degrees F to protect from freezing.

Prior to the application of the concrete coating, the surface shall be clean and free of laitance, dirt, films, paint, coatings, or other foreign matter. Surfaces are to be dry prior to application. The coating should only be applied after the concrete has fully cured, at least twenty-eight (28) days.

The contractor shall use the moisture vapor evaporation rate test per ASTM F1869 to ensure that the rate of moisture vapor emission from the concrete surface is not exceeding 5 pounds per 1,000 sq. ft per twenty-four (24) hours. The contractor shall also perform relative humidity tests per ASTM F2170 to ensure the humidity is below 75 percent.

The coating shall either be sponge, roll or brush applied to the concrete surfaces. If a second coat is required, the second coat shall be applied after two hours of the previous coat but within twenty-four hours. Apply each coat according to the manufacturer's written instructions. Use equipment recommended in writing by the manufacturer for material and texture required, and apply the material at not less than manufacturer's recommended spreading rate.

Mix prepackaged ingredients together according to the manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency. Mix proportions of the ingredients vary by manufacturer and application equipment type.

Apply coating only when temperature of surfaces to be coated and ambient air temperatures are between 55 and 80 degrees F.

The concrete coating should be allowed to cure before the application of the concrete sealer. Clean spattered coating by washing, scraping, or other methods without damaging the concrete or coating.

Comply with the manufacturer's written instructions for recommendations on curing procedures.

Concrete Sealer: The contractor shall provide all necessary equipment for the application of the concrete sealer.

The preparation of the concrete surfaces and application of the concrete sealer shall be done in such a manner as to not damage the concrete and/or the colored cementitious coating and according to the manufacturer's written instructions.

The concrete sealer shall produce a clear matte finish. Before applying product, test the product for desired results in a discrete location on the back face of the retaining walls. The sealer test area shall be approved by the Engineer.

Store the concrete sealant materials not in use indoors away from heat and direct sunlight, and at a minimum ambient temperature of 45 degrees F to protect from freezing.

Prior to application of the concrete sealer, the surface shall be clean and free of laitance, dirt, films or other foreign matter. Surfaces are to be dry prior to application. The sealer should only be applied after the concrete (minimum of twenty-eight (28) days) and/or colored cementitious

coatings have fully cured.

The concrete sealer shall be applied to the manufacturer's written instructions. If a second coat is required, the second coat shall be applied within four to eight hours of the previous coat. Use equipment recommended in writing by the manufacturer for material and texture required, and apply the material at not less than manufacturer's recommended spreading rate.

Mix prepackaged ingredients together according to the manufacturer's written instructions. Mix together with mechanical mixer or by hand to required consistency. Mix proportions of the ingredients vary by manufacturer and application equipment type.

The concrete sealer shall only be applied when the surface or ambient temperature is between 45 and 95 degrees F. Do not apply the sealer if the ambient temperature is expected to fall below 32°F within the curing cycle of the sealer.

The concrete sealer shall be allowed to cure before any foot traffic is allowed adjacent to the retaining wall. Before the sealer dries, clean spattered locations without damaging the concrete, sealer, and/or colored cementitious coating.

Comply with the manufacturer's written instructions for recommendations on curing procedures.

Method of Measurement: This work will be measured for payment in units of square feet, at the locations specified.

Basis of Payment: This work will be paid for at the contract unit price per square foot for CONCRETE SURFACE COLOR TREATMENT. Price shall be payment in full for all labor, materials, and equipment necessary for the application of the coating and sealer.

CROSSHOLE SONIC LOGGING TESTING OF DRILLED SHAFTS

Description: This work shall be according to all applicable sections of the GBSP #91, Crosshole Sonic Logging Testing of Drilled Shafts, except as noted below.

- The Engineer will perform the CSL testing, analysis, and reporting will not be measured for payment.
- Contractor shall furnish and install access ducts in specific drilled shafts identified on the plans.

DRAINAGE SYSTEM

Description: This work shall consist of furnishing all labor, materials, and equipment for the installation of the deck drainage system and any temporary connections and diversions during stage construction as shown in the plans, including all drain pipes, fittings, steel strap pipe hanger, threaded rods, carriage bolts, and all other items shown on the plans for the drainage system.

General: The drainage system shall be a pipe drain system capable of disposing runoff onto the concrete slope wall. The Contractor shall temporarily divert the drainage system runoff during

stage construction if necessary or required by the Engineer.

Construction Requirements: The drain pipe shall be Class 52 ductile iron with 6 in. I.D.

The drainage system shall be an open system and shall outlet onto the slope wall as shown on the plans.

All ductile iron pipe and fittings shall be handled and installed according to guidelines and procedures recommended by the manufacturer or supplier of the material.

Method of Measurement: This work will be measured for payment in units of each for the entire drainage system.

Basis of Payment: This work will be paid for at the contract unit price each for DRAINAGE SYSTEM, at the locations shown on the plans. Price shall be payment in full for all labor, materials, and equipment necessary for the installation of the drainage system.

DRILLED TANGENT PILE RETAINING WALL

Description: This work shall consist of providing all labor, materials, and equipment necessary to install a non-gravity cantilever wall (including walls for bridge abutments) consisting of closely-spaced, reinforced drilled shafts and unreinforced secant lagging. All work shall be according to the details shown on the plans, GBSP #86 “Drilled Shafts” and as directed by the Engineer in addition to the following requirements.

The remainder of the retaining wall components as shown on the plans, such as concrete facing, reinforcement bars in the concrete facing, railings, and various drainage items etc., are not included in this Special Provision but are paid for as specified elsewhere in this Contract.

Materials: The materials used shall satisfy the following requirements:

1. Temporary casing shall be produced by electric seam, butt, or spiral welding to produce a smooth wall surface, fabricated from steel satisfying ASTM A252 Grade 2.
2. The minimum wall thickness shall be as required to resist the anticipated installation and dewatering stresses, as determined by the Contractor, but in no case less than 1/4 in. (6 mm). The temporary casing shall have rock teeth on the bottom of the casing and slots in the top of the casing for twisting the casing into rock. Temporary casing of the appropriate size shall be onsite during drilling operations.

Submittals: Submittals shall be according to Article 516.04 GBSP #86 “Drilled Shafts.” In addition to these submittal requirements the Contractor’s installation method shall maintain the C.I.P. concrete facing location and minimum facing thickness shown in the plans. This method shall be detailed in the installation plan submittal.

General: No shaft excavation, casing installation, or casing removal with a vibrator hammer shall be made within four shaft diameters center to center of a shaft with concrete that has a compressive strength less than 1,500 psi, nor adjacent to secant lagging until the CLSM has reach sufficient

strength to maintain its position and shape unless otherwise approved by the Engineer. The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

Construction Tolerances: The following construction tolerances shall apply to all drilled shafts in addition to the revision requirements to GBSP #86 “Drilled Shafts.”

1. Center of Shaft. The center of the drilled shaft shall be within 3 in. of the plan station and -1/2 in. to +3 in. offset at the top of the shaft. (- offset towards C.I.P facing).
2. Diameter of Drilled Shaft. Oversized production drilled shafts that exceed the construction tolerance provided by the retaining wall concrete facing will require concrete removal for portions of the drilled shaft that exceed the construction tolerance. Concrete removal shall be limited to areas where the concrete facing is installed and provide the minimum concrete facing thickness. The concrete removal method shall not damage the drilled shaft and shall be approved by the Engineer prior to removing. Cost for concrete removal will be at the expense of the Contractor and to the satisfaction of the Engineer.
3. Center of Reinforcement Cage. The center of the reinforcement cage shall be within 1 1/2 in. of plan station and -1/2 in. to +1 1/2 in. offset at the top of the shaft (- offset towards C.I.P. facing).

Excavation: Excavation in front of the drilled shafts as necessary to place a concrete facing and complete the roadway work shall be made and paid for according to Section 502 except that the horizontal limits for structure excavation shall be from the face of the drilled shafts and secant lagging to a vertical plane 2 ft from the finished face of the wall. The depth shall be from the top of the drilled shaft to the bottom of the concrete facing.

Geocomposite Wall Drain: When required by the plans, the geocomposite wall drain shall be installed and paid for according to Section 591 except that the drain shall be fastened to the soil face. The pervious (fabric) side of the drain shall be installed to face the soil.

Demonstration Shaft:

1. Demonstrate equipment and methods, prior to construction of the first production drilled shaft, by installing a non-production drilled shaft. This non-production drilled shaft shall have CSL tubes installed according to the General Notes of the SN 084-9966. Install shaft on site at a location the Engineer determines. The demonstration shaft shall not be at a location of a permanent shaft required for the wall or bridge construction.
2. Construct a 5 ft – 0 in. diameter demonstration shaft a minimum of 6 ft into bedrock. The shaft shall be constructed using a temporary casing. A reinforcing steel cage, designed by the Contractor, to adequately support the CSL tubes will be required for the demonstration shaft. Concrete shall be placed in the shaft

according to the specifications.

3. Construct the demonstration shaft according to the requirements of this specification.
4. The Contractor shall excavate 6 ft below the top of the demonstration shaft to expose the upper portion of the shaft. This excavation shall be all-around the shaft. This will facilitate in determining the approximate as-built shaft size due to oversizing the drilled hole to install the temporary casing and verify if the shaft will satisfy the construction tolerances provided by the concrete retaining wall facing.
5. If the demonstration shaft installation demonstrates the equipment and methods used to construct drilled shafts to the requirements of this specification are inadequate, the Engineer will require appropriate alterations in equipment or methods, or both, to eliminate the unsatisfactory results. The Contractor may be required to perform additional demonstration shafts until an adequate procedure is demonstrated and approved by the Engineer. Additional demonstration shafts, alterations to equipment and/or methods will be at the expense of the Contractor.
6. Do not begin constructing production drilled shafts until the Engineer approves the methodology and reviews the CSL report. The CSL testing will be completed by the Engineer at no additional cost to the Contractor. The Engineer will complete the review process within five (5) working days of receiving the CSL report.
7. Cost for installing the demonstration shaft and excavating around the drilled shaft will not be measured or paid for but shall be included in the cost of DRILLED SHAFT IN SOIL and DRILLED SHAFT IN ROCK.

Drilling and placing CLSM secant lagging shall be measured for payment in cubic feet of the shaft excavation required to install the secant lagging as shown in the plans. This volume shall be the theoretical volume computed using the diameter(s) shown on the plans and the difference in elevation between the as built shaft excavation bottom and the ground surface at the time of the CLSM placement.

Basis of Payment: The secant lagging will be paid for at the contract unit price per cubic foot (cubic meter) for SECANT LAGGING. The required shaft excavation and CLSM backfill required to fill that excavation shall be included in this item.

Mitigation of undisclosed obstructions shall be paid for according to Article 109.04.

Excavation through existing utilities and sewers where shown on the plans shall not be considered extra work, but shall be included in the cost for DRILLED SHAFT IN SOIL.

No additional compensation, other than noted above, will be allowed for removing and disposing of excavated materials, for furnishing and placing concrete, CLSM, bracing, lining, temporary

casings placed and removed or left in place, or for any excavation made or concrete placed outside of the plan diameter(s) of the shaft(s) specified.

FLOOR DRAINS (SPECIAL)

Description: This work shall consist of furnishing all labor, materials, and equipment for the installation of the floor drains including iron pipe, cast iron grate, and all materials required for the connection of pipe to grate.

General: The floor drains shall be capable of collecting runoff from the deck and depositing it into the drainage system.

Construction Requirements: The floor drain shall be composed of a 6 in. interior diameter ductile iron pipe and heavy duty grey cast iron solid pipe grate with a 6 ¾ in. diameter and a 3 in. depth at grate for a 6 in. diameter pipe.

Method of Measurement: This work will be measured for payment in units of each.

Basis of Payment: This work will be paid for at the contract unit price each for FLOOR DRAINS (SPECIAL). Price shall be payment in full for all labor, materials, and equipment necessary for the installation of the floor drains.

FORM LINER TEXTURED SURFACE

Description: This work shall consist of designing, developing, furnishing and installing form liners and forming concrete using reusable, high-strength urethane form liners to achieve the concrete treatment as shown in the drawings and specifications. Form lined surfaces shall include areas of the wall facing, where shown in the plans. Work shall be performed in accordance with applicable portions of Sections 503 and 504 of the Standard Specifications.

Form liners shall be installed 12 in. below finish grade unless otherwise shown on the plans. The form liner shall match the exact size of concrete units and adhere to the provisions listed herein and in the Plans.

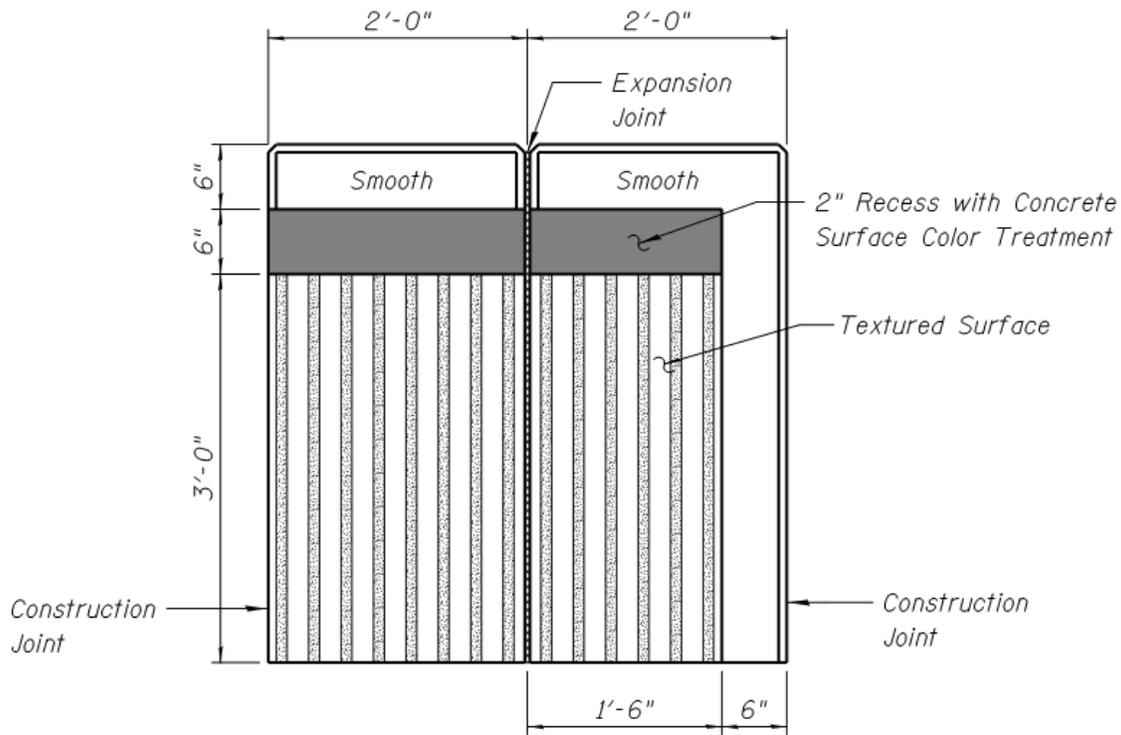
Materials: Form liners shall be high quality, highly reusable and capable of withstanding anticipated concrete pour pressures without causing leakage or causing physical defects.

Form liners shall attach easily to pour-in-place forms and be removable without causing concrete surface damage or weakness in the substrate. Liners used for the texture shall be made from high-strength elastomeric urethane material which shall not compress more than 0.02 ft when poured at a rate of 10 vertical ft per hour. Form release agents shall be non-staining, non-residual, non-reactive and shall not contribute to the degradation of the form liner material.

Form Liner Mockup: The Contractor shall provide cast concrete mockup(s) containing the form liner surface.

Purpose of the mockup is to verify the pattern to be used, demonstrate details of form liner construction, and provide a visual quality standard.

1. Locate a mockup at construction location as directed by the Engineer. Mockup shall be readily accessible to construction personnel and the Engineer at all times during form liner construction.
2. The mockup shall be a minimum 4 ft x 4 ft x 6 in. thick and shall be cast in a vertical position, representative of the actual construction.
3. Include examples of each condition required for construction (i.e. liner joints, construction joints, expansion joints, edges of textured surface, form ties, etc.) See Exhibit A, provided below.
4. Upon receipt of comments from inspection of the mockup, adjustments or corrections shall be made where imperfections are found. If required, additional mockups shall be prepared when the initial mockup is found to be unsatisfactory.
5. After mockup is determined to be acceptable by the Engineer, construction of project may proceed.



Include one horizontal and one vertical liner joint within textured surface.

Exhibit A- Elevation View of Mockup Panel

Formliner Pattern: The form liner pattern shall be a large, vertical fractured fin. The uniform spacing between the raised, textured fins shall be not less than 2 in., nor more than 3 in. The maximum depth of the pattern shall be not less than 1.5 in., nor more than 2.0 in.

The following form liner manufacturers are known manufactures that provide a large fractured fin pattern form liner for use with the cast-in-place concrete units.

- a. Fitzgerald Formliners, Santa Ana, CA, #16957 Harvard Fin
- b. Scott System, Denver, CO, #101 Cleveland Flute
- c. customrock, St. Paul, MN, #204 Fractured Fin

A pattern “Exhibit B” is provided below, illustrating the desired appearance.

**Scott System #101
Cleveland Flute**

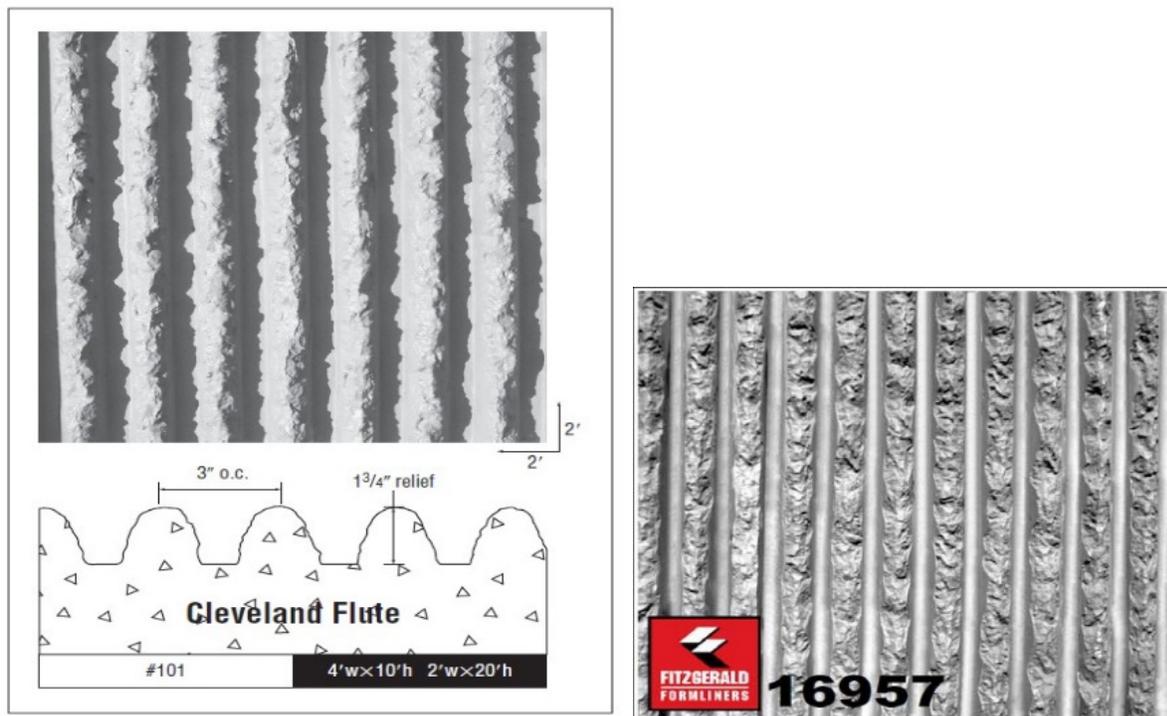


Exhibit B- Cast-in-place Pattern

Installation: Form liners shall be installed in accordance with the manufacturer’s recommendations to achieve the highest quality concrete appearance possible. Form liners shall withstand concrete placement pressures without leakage causing physical or visual defects. A form release agent shall be applied to all surfaces of the liner which will come in contact with concrete as per the manufacturer's recommendations. After each use, liners shall be cleaned and made free of build-up prior to the next placement, and visually inspected for blemishes or tears. If necessary, the form liners shall be repaired in accordance with the manufacturer's recommendations. All form liner panels that will not perform as intended or are no longer repairable shall be replaced. An on-site inventory of each panel type shall be established based on the approved form liner shop drawings and anticipated useful life for each form liner type.

The liner shall be securely attached to the forms according to the manufacturer's recommendations. Liners shall be attached to each other with flush seams and seams filled as necessary to eliminate visible evidence of seams in cast concrete. Liner butt joints shall be blended into the pattern so as to create no visible vertical or horizontal seams or conspicuous form

butt joint marks. Liner joints must fall within pattern joints or reveals. Finished textures shall be continuous without visual disruption and properly aligned over adjacent and multiple liner panels. Continuous or single liner panels shall be used where liner joints may interrupt the intended pattern. Panel remnants shall not be pieced together.

The Contractor shall coordinate concrete pours to prevent visible differences between individual pours or batches. Concrete pours shall be continuous between construction or expansion joints. Adjust form liner to align concrete joints between fins of the textured surface. Construction joints may be shifted ± 1 inch from plan location to achieve a continuous, uniformly spaced pattern. Wall ties shall be coordinated with the liner and form to achieve the least visible result. Liners shall be stripped between twelve (12) and twenty-four (24) hours as recommended by the manufacturer. Curing methods shall be compatible with the desired aesthetic result. Use of curing compounds will not be allowed.

The Contractor shall employ proper concrete placement and consolidation methods to ensure a high quality finish. A self-consolidating concrete is required in all wall facings where form liners are specified. The finished exposed formed concrete surfaces shall be free of visible vertical seams, horizontal seams, and butt joint marks. Grinding and chipping of finished formed surfaces shall be avoided.

Method of Measurement: This work will be measured for payment in place and the area computed in square feet.

Required adjustments or corrections needed to address mockup comments and the cost of additional mockups, if required, will not be paid for separately, but shall be included in respective pay item.

Basis of Payment: Form lined surfaces will be paid for at the contract unit price per square foot for FORM LINER TEXTURED SURFACE. The unit price bid shall include all labor and material costs associated with designing, developing, furnishing and installing form liners, forming, and disposal of forms, including satisfactory cast concrete mockup panel(s) to the requirements included herein.

FOUNDATION REMOVAL

This work shall consist of the removal of the concrete foundations at the locations as shown on the plans. Concrete foundations shall be measured in the plan view and shall be removed to at least one foot below final grade or to the satisfaction of the Engineer with all removed material to be disposed of according to Article 202.03.

All material, equipment and labor to perform this work shall be paid for at the contract unit price per square foot for FOUNDATION REMOVAL and shall be performed to the satisfaction of the Engineer.

FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE

Description: This work shall consist of furnishing, fabricating, transporting, erecting and painting steel structure or portions thereof for the structures listed below.

SN 084-9964 (UPRR over Cook Street) – BRIDGE NO. 1

SN 084-9965 (NSRR over Cook Street) – BRIDGE NO. 2

SN 084-9966 (UPRR over South Grand Avenue) – BRIDGE NO. 3

SN 084-9967 (NSRR over South Grand Avenue) – BRIDGE NO. 4

General: Structural steel shall be fabricated to comply with the requirements indicated on the design drawings. The furnishing and erecting of structural steel shall be in accordance with this specification and applicable sections of Section 505 of the Standard Specifications for Road and Bridge Construction.

Construction Requirements: All structural steel supplied shall comply with the applicable ASTM standards listed in the plans.

Furnishing and installing the bearings shall comply with Section 521 of the Standard Specifications for Road and Bridge Construction.

The preformed fabric bearing pads, for the bearings, approved for use shall be Shock Pad Style No. 15175 as manufactured by Alert Manufacturing and Supply Company, Chicago, Illinois, or FABREEKA Pads as manufactured by Fabreeka Products Company, 1190 Adams Street, Boston, Massachusetts, or SORBTEX Pads as manufactured by Voss Engineering, Inc., Chicago, Illinois.

Field Weld Inspection Requirements: The Contractor shall be responsible for visual inspection and Nondestructive Testing (NDT) according to the ANSI/ASSHTO/AWS D1.5 Bridge Welding Code and necessary correction of all deficiencies in material and workmanship. Fillet welds joining steel deck plates to the top flange of the primary members shall be magnetic particle tested (MT) according to the bridge welding code. Costs of this shall be included in the unit price for FURNISHING AND ERECTING STRUCTURAL STEEL of the respective bridge.

Method of Measurement: This work will be measured for payment according to Section 505.12 of the Standard Specifications for Road and Bridge Construction.

Basis of Payment: This work will be paid for at the lump sum price for FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 1 and FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 2, FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 3 and FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE NO. 4. Price shall be payment in full for all labor, materials, and equipment necessary for furnishing, erecting, fabricating, transporting, and painting structural steel.

The cost for furnishing and installing the bearings and anchor bolts shall be included in the lump sum price for FURNISHING AND ERECTING STRUCTURAL STEEL BRIDGE, NO. 1, NO. 2, NO. 3 or NO. 4,

HANDRAIL REPAIRS

Description: This work includes removal, modifications, and repairs of existing two-rail handrail at the Cook Street underpass. Limits of removal shall be as shown on the plans. Modifications, including any new handrail, shall follow the plan details with any adjustments required to match existing conditions. Repair work includes cleaning and sealing all pipe sleeve base sockets, resetting loose posts, and restoring misaligned expansion joints.

Materials: Materials shall be according to Articles 509.02 and 1050.04

General: Work shall be according to Section 509 and the following.

Before beginning work the Contractor shall inspect the existing handrail. Contractor shall mark for approval by the Engineer all posts and rails to be removed or repaired. Submit shop drawings showing modified and new handrail sections.

Use high pressure air or water to remove debris and loose grout from all existing pipe sleeve base sockets. Use mechanical methods to remove damaged grout if required. to securely attach posts to wall. Fill sockets with grout to within ¼ in. or concrete surface. Fill remainder of socket with sealant after grout has set.

At misaligned and/or separated handrail expansion joints, straighten rail and reinstall slip-fit connection.

Posts to be removed shall be pulled or cut off below the concrete surface. Fill socket with grout and sealant.

Modified and new railing shall be fabricated to match existing handrail, except that posts shall be fastened to concrete using flange plates and anchors. Connections to existing handrail may be field welded.

Field painting of handrail is included in other items of work.

Basis of Payment: This work will paid for at the contract lump sum price for HANDRAIL REPAIRS.

MEMBRANE WATERPROOFING

This work shall be in accordance with Section 580 of the Standard Specification except as modified within this Special Provision.

In lieu of using a Butyl Rubber Membrane the Contractor may elect to use an Ethylene Propylene Diene Terpolymer (EPDM) membrane at no additional cost to the contract. The EPDM membrane shall be equivalent to the Butyl Rubber Membrane and approved by the Engineer prior to installation.

MEMBRANE WATERPROOFING, SPECIAL

Summary:

- A. Section Includes:
1. Bridge Membrane:
 - a. Furnish labor, products and equipment required for the application of a seamless, spray elastomer coating system to suitable concrete, masonry or structural and miscellaneous metal surfaces.
 - b. The membrane system shall be capable of sealing across the typical expansion joint system without the need to use a separate gland and bonding agents on the membrane.
 - 1) This will assure a continuous waterproofing membrane system across the entire deck.
 2. Integrated Ballast Protection Mat:
 - a. Furnish labor, products and equipment required for the application of a spray Integrated Ballast Mat system to suitable concrete, masonry or metal surfaces.
 - b. The Integrated Ballast Mat system shall be a spray applied, 100 percent solids, fast cure, high build polymer system combined with proprietary SBR rubber blend.
 3. Expansion Joints:
 - a. Furnish labor, products and equipment required for the application of a preformed elastomeric expansion joint system to concrete and steel substrates as shown in the Plans and specified herein.
 - b. The joint system shall be a preformed, and constructed using a two-component, fast cure, high build coating system, and shall be chemically compatible with the structure waterproofing membrane system, so that both the joint system and waterproofing membrane form a continuous waterproofing system.
 - c. The joint system shall be secured to the concrete or steel structure using the same two-component, fast cure, high build coating system.
- B. Related Specification Sections include but are not necessarily limited to:
1. IDOT Standard Specifications for Road and Bridge Construction

Quality Assurance:

- A. Referenced Standards:

1. AREMA – American Railway Engineering and Maintenance-of-Way Association Manual for Railway Engineering
 - a. C-8.29.9.10, Cold Liquid-Applied Elastomeric Membrane (2005)
2. ASTM International (ASTM):
 - a. C661, Standard Test Method for Indention Hardness of Elastomeric-Type Sealants by Means of a Durometer.
 - b. C836, Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course.
 - c. D57, Standard Test Methods for DC Resistance or Conductance of Insulating Materials.
 - d. D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - e. D624, Standard Specification for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - f. D6378, Standard Test Method for Tensile Properties of Plastics.
 - g. D2240, Standard Test Method for Rubber Property – Durometer Hardness.
 - h. D4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
 - i. D4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
 - j. E96, Standard Test Method for Water Vapor Transmission of Materials.
3. The Society for Protective Coating (SSPC):
 - a. SP 5, White Metal Blast Cleaning.
 - b. SP 6, Commercial Blast Cleaning.
 - c. SP 10, Near-White Metal Blast Cleaning.
 - d. PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.
 - e. PA 9, Measurement of Dry Coating Thickness on Cementitious Substrates using Ultrasonic Gages.
4. The Society for Protective Coatings/NACE International (SSPC/NACE):
 - a. SP 13/NACE No. 6, Surface Preparation of Concrete.

B. Quality Control Provisions:

1. Manufacturer Qualifications;
 - a. Use manufacturer with minimum five years experience providing similar systems on railroad bridge decks.
 - b. The manufacturer should be a primary blender with proprietary formulations, an Authorized Applicator training program, capacity to

provide field technical services as required and manufacturer to issue warrantee to Owner.

- c. List a manufacturer's batch numbers for each unit of product used in Work.

C. Quality Assurance Provisions:

1. Schedule pre-installation conference to review installation schedule, shut down and restricted access procedures.
 - a. Indicate Owner's Representative and Contractor's Superintendent.
2. Inspect surface preparation, application procedures, and review proposed dry film thickness measurements at each installation location.
3. The membrane system shall pass Crack Bridging Test according to ASTM C836 at 80 mils, or the membrane thickness applied shall be at least equal to the thickness used by the manufacturer for ASTM C836 testing.
4. The membrane system shall meet AREMA C-29.9.10 cold applied waterproofing membrane, and shall be applied at a minimum thickness of 80 mils, or the membrane thickness applied shall be at least equal to the thickness used by the manufacturer to pass the Crack Bridging Test according to ASTM C 836.
 - a. Primer is required for all membrane applications.
5. The base waterproofing membrane for the integrated ballast protection mat shall pass Crack Bridging Test according to ASTM C836 at the thickness applied and shall be at least equal to the thickness used by the manufacturer for the ASTM C836 testing.
6. Joint membrane material shall be subjected to cyclic displacement testing.
 - a. Cyclic displacement testing shall include tests at seismic displacements and velocities.

D. Quality Assurance Provisions:

1. Schedule pre-installation conference to review installation schedule, shut down and restricted access procedures.
 - a. Indicate Owner's Representative and Contractor's Superintendent.
2. Inspect surface preparation, application procedures, and review proposed dry film thickness measurements at each installation location.
3. The membrane system shall pass Crack Bridging Test according to ASTM C836 at 80 mils, or the membrane thickness applied shall be at least equal to the thickness used by the manufacturer for ASTM C836 testing.
4. The membrane system shall meet AREMA C-29.9.10 cold applied waterproofing membrane, and shall be applied at a minimum thickness of 80 mils, or the membrane thickness applied shall be at least equal to the thickness used by the manufacturer to pass the Crack Bridging Test

according to ASTM C 836.

- a. Primer is required for all membrane applications.
5. The base waterproofing membrane for the integrated ballast protection mat shall pass Crack Bridging Test according to ASTM C836 at the thickness applied and shall be at least equal to the thickness used by the manufacturer for the ASTM C836 testing.
6. Joint membrane material shall be subjected to cyclic displacement testing.
 - a. Cyclic displacement testing shall include tests at seismic displacements and velocities.

Definitions:

- A. Ballast: Rock or other material used to bed rail track ties.
- B. Concrete Surface Preparation: SSPC-SP 13/NACE No. 6.
- C. Metal Surface preparation: SSPC Metal Preparation Standards – SSPC-SP 5, White Metal Blast; SP 6, Commercial Blast; and SP 10 Near White Blast.

Submittals:

- A. Submit product data sheets and installation Specification.
- B. Submit MSDS sheets for product used in the Work.
- C. Submit substrate preparation details.
- D. Submit sample of proposed membrane.
 1. 4 in. (100 mm) square sample shall include color, texture, and thickness of proposed membrane system.
- E. Submit qualifications of applicator at least three weeks prior to installation.
- F. Submit spray schedule to Engineer at least two weeks prior to installation.

Project Conditions:

- A. Environmental Requirements:
 1. Install system when air and substrate temperature is above -20 DegF and substrate is +5 DegF above dew point and rising, or as required by manufacturer.
- B. Personnel Requirements:
 1. Provide protective clothing, gloves, and respirators for use by installers as required.

Approved Manufacturer:

- A. Bridge Preservation:
 686 South Adams
 Kansas City, KS 66105
 913-321-9000
- B. Alternative products will be allowed but must meet this specification and/or be approved by the Engineer and railroad.

Materials:

- A. Primer
 - 1. Bridge deck concrete primer:
 - a. 100 percent solids, two component polymer primer.
 - 2. Bridge deck steel primer:
 - a. Single component modified polymer primer.
- B. Bridge deck membrane:
 - 1. 100 percent solids, rapid curing elastomer.
 - a. Spray Installed.

<u>Property, Cured Product</u>	<u>Test Method</u>	<u>Typical Value</u>
Solids Content		100%
Shore Hardness	ASTM D 2240	50 D
Elongation	ASTM D 638	.250%
Tensile Strength, psi Tear	ASTM D 638	>2,000
Strength, pli, Die C	ASTM D 624	390
Tabor Abrasion, mg. Loss (1000 gm, 1000 rev, H-18)	ASTM D 4060	250
Moisture Vapor Transmission	ASTM E 96	<0.025 perms
Gel Time		<10 Seconds
Tack Free		<30 Seconds
Open to Light Traffic		1 Hour
Electrical Resistance	ASTM D 257-99	$\geq 2.0 \times 10^{13}$ ohm-cm
Crack Bridging Test (80 Mils - 1/8 IN Opening @ -15 DegF, 25 cycles)	ASTM C 836-00	Pass
Ballast Test (North American)	2 Million Cycles	No Damage

- C. Integrated ballast mat:
 - 1. Bridge deck top coat:
 - a. 100 percent solids, rapid curing elastomer.
 - b. Spray Installed.

<u>Property, Cured Product</u>	<u>Test Method</u>	<u>Typical Value</u>
Solids Content		100%
Shore Hardness	ASTM D 2240	<50 D
Elongation	ASTM D 638	>250%
Tensile Strength, psi	ASTM D 638	>2,000
Tear Strength, pli, Die C	ASTM D 624	>390
Tabor Abrasion, mg. Loss (1000 gm, 1000 rev, H-18)	ASTM D 4060	>250
Moisture Vapor Transmission	ASTM E 96	<0.025 perms

Gel Time	<90 Seconds
Tack Free	<2 Minutes
Ballast Loading	1 Hour
Ballast Impact Test, Loading 9.2 - 28.1 Kips, 2,000,000 Cycles	Pass

D. Preformed Joint Materials:

1. Expansion Joint:

- a. Preformed elastomeric expansion joint system designed specifically for use on concrete and steel structures.
- b. Designed to be used in conjunction with specified spray applied waterproofing membrane, to form a continuous monolithic membrane and joint system across the entire structure.

<u>Properties</u>	<u>Test Method</u>	<u>Typical Value</u>
Shore Hardness	ASTM D2240	<45D
Elongation	ASTM D638	>250%
Tensile Strength, psi	ASTM D638	>2,000
Tear Strength, pli, Die C	ASTM D624	>390
Operating Temperature Range		-40°F to 400°F
Movement Capability (of nominal joint size)		+50% and -50%

E. Coating and Joint Anchoring Materials:

1. Primer – bridge deck concrete primer.

- a. Plural component primer for porous substrates.

<u>Properties</u>	<u>Test Method</u>	<u>Typical Value</u>
Color		Amber/ White
Solids Content, %		89
Elongation		6%
Shore D Hardness	ASTM D2240	71
Tensile Strength, psi	ASTM D638	4,500
Adhesion to Substrate, psi, concrete	ASTM D 4541	>150
Viscosity, cps, neat, 770 F		25
VOC g/l	ASTM D 4541	2.3
Pot Life @ 770 F		5 min
Tack Free @ 770 F Final Cure @ 770 F		15 min
Tack Free @ 770 F Final Cure @ 770 F		20 min

F. Joint Adhesive:

1. Bridge deck joint adhesive.

- a. A slow setting, 100 percent solids, two-component polymer product.

<u>Property, Cured Product</u>	<u>Test Method</u>	<u>Typical Value</u>
Solids Content Shore		100%
Hardness	ASTM D 2240	<50 D
Elongation	ASTM D 638	>250%
Tensile Strength, psi	ASTM D 638	>2,000
Tear Strength, pli, Die C	ASTM D 624	390
Gel Time		>90 Seconds
Tack Free		>2 Minutes

G. Surface Activator:

1. Bridge deck membrane surface activator.
 - a. Single component activating agent used to treat expansion joint surfaces prior to adhesive or over coating applications.
 - b. May also be used with bridge deck membrane at coating overlap areas where coating has cured for more than 24 HRS.

<u>Typical Physical Properties</u>	<u>Typical Value</u>
Viscosity @ 25°C	N.D.
Appearance	Clear Liquid
Odor	Mild Sweet Odor
Specific Gravity @ 25°C	1.08
Flash Point	>200
Vapor Density (Air = 1)	N.D.

H. Joint Sealant (OPTIONAL):

1. Bridge deck joint sealant.
 - a. Single component, moisture-curing product which can be used as an optional double joint.

<u>Typical Physical Properties</u>	<u>Typical Value</u>
VOC Content	35.1 g/l
Shore Hardness	ASTM C 661 25A
Elongation	ASTM D 412 >600%
Tensile Strength, psi	ASTM D 412 400
100% Modulus, psi	ASTM D 412 44
Service Temperature	-22°F - 176°F
Specific Gravity	1.17
Tack-Free Time @ 73°F and 50% RH	90 - 150 minutes

Equipment:

- A. Contractor shall utilize heated 1:1 plural component heated equipment capable of at least 100 DegF Delta T without recirculation and continuous discharge pressure of 2,500 psi.
 1. Pump shall have heated hose capable of maintaining 170 DegF Temperature at all times.
 2. Spray gun shall be impingement mix with either air or mechanical purge.
 3. Pump shall be capable of recording critical functions, including, product temperature of A component, B component, hose temperature, fluid pressure of A component, B component, number of pump cycles, and pump error codes.
 4. Contractor shall have a minimum of two spray guns in working order present at all times during the application.
 5. Backup parts for critical components such as feed pumps and proportioning cylinders shall be required.
 6. Contractor shall have pump, electrical generator, air compressor, supplies, spare parts and materials in a self-contained truck or trailer.

Execution

Inspection:

- A. Assure all owner property construction requirements have been made and completed prior to commencement of primer and coatings installation.
- B. Prior to application of primer inspect and approve substrate preparation.

Preparation:

- A. Bridge Membrane and Integrated Ballast Mat:
 - 1. Provide clean, sound and dry surfaces.
 - 2. Sand blast metal surfaces to remove laitance and other contamination and provide suitable 3-5 mil blast profile.
 - 3. Prepare metal surfaces to SSPS-SP 10 near White Blast or better.
 - 4. Metal surfaces must be above dew point prior to application.
 - 5. Repair spalls and other defects with Five Star Structural Concrete or other as acceptable to the Manufacturer.
 - 6. Prepare concrete surfaces to SSPC SP 13/NACE No. 6 Surface Preparation of Concrete.
 - 7. Concrete to have less than 5.0 percent moisture content prior to installation of primer.
 - 8. Test prepared steel surface using Elcometer adhesion testing (ASTM D 4541).
 - a. Minimum pull strength is 400 psi.
 - 9. Test prepared concrete surface using Elcometer adhesion testing (ASTM D 4541).
 - a. Minimum pull strength is 150 psi or failure in the concrete substrate.
 - 10. Mask protected surfaces prior to spray applications.
 - 11. Erect spray curtains and partitions as required.
- B. Expansion Joints: Joint fascia shall be of a uniform width and height.

Installation:

- A. Bridge Membrane and Integrated Ballast Mat:
 - 1. Mix all products in accordance with manufacturer's written instructions.
 - 2. Steel Surfaces:
 - a. Spray or roll primer at 600 – 800 SR/GAL over surfaces to receive coating system.
 - b. Allow primer to go tack free before spraying Bridge Deck Membrane.
 - c. Primer is not necessary provided steel surface is prepared to 5 mil profile or better and no rust present.
 - 3. Concrete Surfaces:
 - a. Spray, squeegee or roll concrete primer at 130-200 SQ FT/GAL over surfaces to receive coating system.
 - b. Allow primer to go tack free before spraying Bridge Deck Membrane.

4. Concrete and masonry surfaces must have less than 5.0 percent moisture prior to installation.
 5. Metal surfaces must be dry, rust-free, and have proper SSPC profile and preparation.
 6. Reapply primer if set more than twenty four (24) HRS.
 7. Spray base coat over primed deck surfaces at 20 SQ FT/GAL for a total thickness of 80 mils on all surfaces.
 8. Retouch coat by filling low spots or areas with inadequate thickness.
 9. Spray additional base coats to achieve specified system thickness.
 - a. Retouch as required.
 10. Spray membrane over primed surfaces at 20 SF/GAL (80 mils) by using a Graco Reactor pumping system or other approved by the manufacturer.
 11. Apply a base coat of Bridge Deck Membrane at 80 mils, followed by SBR rubber aggregate broadcast into Bridge Deck Top Coat in two lifts applied at 40 mils per lift with rubber aggregate broadcast.
 - a. Apply a third 40 mil lift to seal rubber aggregate particles.
 12. Apply immediately broadcast rubber aggregate at 0.25 to 0.35 LBS/FT² to achieve 100 percent coverage rate.
 - a. Remove excess aggregate after initial set and repeat process a second time, followed by a 40 mil seal coat to lock rubber aggregate.
 13. Total thickness of Integrated Ballast Mat system is 1/4 IN (250 mils, 6.3 mm) on all surfaces.
- B. Expansion Joints:
1. Concrete and steel structures to receive joint shall be free of surface defects such as air voids, fins, form-release agents and honeycombs, scaling, rust and shall be uniform in width.
 2. Apply primer over concrete or masonry surfaces to receive joint system.
 - a. Surfaces to receive adhesive membrane must be surface dry prior to application of primer and coating.
 3. Reapply primer if set more than 24 HRS.
 4. Assemble pre-molded joint sections, cutting joint sections to allow a minimum 4 in. overlap between sections.
 5. Surfaces to be adhered and overlap sections must be treated with Bridge Preservation Activator 15 minutes prior to application.
 6. Spray applied at 60 to 80 mils to adhere both the joint flanges and seal joint overlaps.
 7. Spray coating over primed surfaces at a rate of 60 to 80 mils, and immediately place joint flaps or overlap sections into the liquid material.
 8. For coating and joint anchoring materials, apply uniform pressure to freshly sprayed areas to insure positive contact between joint sections and coating material.
 9. For coating and joint anchoring materials, apply by brush, spray, or roller to clean, dry, properly prepared surfaces at 160-200 SF/GAL depending on substrate porosity.
 - a. Allow primer to dry to the touch before overcoating.

10. Inspect joint flaps and overlap sections to insure that all areas are properly adhered and sealed.
 - a. Retouch areas where additional coating is required to insure a watertight seal.
 11. On ballasted decks, the joint system shall have a minimum 3/8 in. galvanized steel plate with a minimum 4 in. overlap on each side of the joint fascia, and shall be held in place by imbedding in a liquid mastic or anchored on one side of the joint header using mechanical fasteners.
- C. Coating to Joint Overlap Installation:
1. Apply primer over concrete or masonry surfaces to receive coating system.
 - a. Surfaces must be surface dry prior to application of primer and coating.
 2. Reapply primer if set more than 24 HRS.
 3. Surfaces to be over coated must be treated with Bridge Deck Membrane Surface Activator 15 minutes prior to application.
 4. Spray coating over treated joint surfaces and primed concrete surfaces at authorized rate.
 5. Spray additional base coats to achieve specified base coat thickness.
 - a. Retouch as required.
- D. Double Joint:
1. Install closed cell backer rod in joint opening (if not utilizing optional Double Joint).
 2. Install 3/8 in. galvanized steel plate over finished joint system.
 - a. Steel plate provided by others.
 - b. Secure to the substrate by mastic caulking or by securing one side using mechanical fasteners.
 - c. Apply a sealant in the anchor holes prior to inserting mechanical fasteners to insure a proper seal.

Field Quality Control:

- A. Perform dry film thickness tests in accordance with SSPC-PA 2 Measurement of Dry Coating Thickness or SSPC-PA 9, Measurement of Dry Coating Thickness on Cementitious Substrates Using Ultrasonic Gages.
- B. Use magnetic or ultrasonic test equipment, destructive testing, or stroke per gallon method of assuring proper film thickness.
 1. Spray equipment is calibrated and tested to a stroke count per gallon of product sprayed.
 - a. This is suitable for thickness assurance on most project.
 2. Ultrasonic testing is usually accurate to +/-5 percent.
 3. Repair destructive testing areas by respraying or filling with special two component gun grade material provided by manufacturer.
- C. Other components of the system may be wet film tested for thickness.

- D. Maintain spray and other installation equipment in proper operating condition throughout installation.
 - 1. Provide reserve equipment as required.
- E. Ensure that joint overlaps are a minimum of 4 in. and are properly sealed revealing no pinholes of defects in the joint overlap.

Cleaning:

- A. Clean spills and oversprays as they occur.
- B. Consult manufacturer's literature and MSDS sheets for proper cleaning products and methods.
- C. High pressure water clean any liner of covering material used to contain overspray and other debris.
- D. Remove drums and waste material.
- E. Clean site to Owner's satisfaction prior to final acceptance.

Protection:

- A. Protect installed work prior to acceptance by owner.
- B. Provide protective clothing, gloves, and respirators for use by installers as required.

Method of Measurement and Basis of Payment:

Method of Measurement:

- A. The elastomeric cold spray applied waterproofing will be measured in square feet of a horizontal surface area of deck finished and in place. Measurement will be based on the horizontal distance between the face of curbs and the horizontal length of the membrane installed. Membrane waterproofing applied to the curb and backwall faces will not be measured for payment but shall be included in the unit price for MEMBRANE WATERPROOFING (SPECIAL).

Basis of Payment:

- A. This work will be paid for at the contract unit price per square feet for MEMBRANE WATERPROOFING (SPECIAL) which price will be payment in full for completing the work according to these specifications.

PRECAST PRESTRESSED CONCRETE FASCIA BEAM

Description: This work shall consist of furnishing all labor, material, and equipment for the fabrication and erection of a precast prestressed concrete fascia beam including the curb on top of the fascia beam.

General: Except as otherwise specified hereafter, the current Standard Specifications for Road and Bridge Construction, Section 504 – Precast Concrete Structures and Section 1042 – Precast Concrete Products, shall apply to all work under this section.

Construction Requirements: Fly Ash, Slicafume and/or slag cement and any other admixtures, approved by the Engineer, shall be in addition to the minimum cement content listed in the Standard Specifications for Road and Bridge Construction, Section 1020-Portland Cement Concrete, not in lieu of cement.

Lifting loops shall be provided in the detailed locations on the design drawings. The area around all lifting loops shall be recessed so that the loops can be removed to a depth of $\frac{3}{4}$ in. and grouted.

Method of Measurement: This work will be measured for payment in units of lump sum.

Basis of Payment: This work will be paid at the contract unit lump sum price for PRECAST PRESTRESSED CONCRETE FASCIA BEAM, No. 1 or No. 3. Price shall be payment in full for all labor, materials, and equipment for fabrication and erection of the precast prestressed concrete fascia beam.

REMOVAL OF EXISTING STRUCTURES

Description: This work shall be in accordance with Article 501 of the Standard Specifications and will include the following structures.

- Removal of Existing Structures No. 1 – Retaining wall between existing Cook Street pump station and NSRR
Removal will include retaining wall between approximate Sta. 47771+89, 38' RT and Sta. 47772+35, 38' RT. Wall stem shall be completely removed to the top of footing between existing joints. Footing may remain in place.
- Removal of Existing Structures No. 2 – NSRR bridge over Cook Street, S.N. 084-9939
Removal will include track, ballast, railing, superstructure, bearings and pier, Pier shall be completely removed, including stem and footing. Protect shale bedrock surface from exposure during and after demolition of pier. Existing seal coat may remain and be incorporated into proposed construction if it remains in firm contact with bedrock. Abutment walls are to remain and shall be protected from damage during demolition of the superstructure. Cap bridge deck drainage pipes below the ground surface and abandon in place.
Partial removal of abutment concrete to accommodate the new bridges is included in

other items of work.

- Removal of Existing Structures No. 3 – Retaining wall along south side of South Grand Avenue
Removal will include a portion of the retaining wall as shown on the plans. Wall shall be completely removed, including entire footing between existing expansion joints. Saw cut footing and stem at end that will abut new construction, if existing joint cannot be completely separated along a straight and true line.
- Removal of Existing Structures No. 4 – NSRR bridge over South Grand Avenue, S.N. 084-9947
Removal will include track, ballast, railing, superstructure, bearings, and abutments. Abutment walls shall be removed to the top of footing. Footings shall be partially removed in areas where they conflict with proposed drainage structures, storm sewers, retaining walls, and slope wall

Basis of Payment: This work will be paid for at the contract unit price per each for REMOVAL OF EXISTING STRUCTURES at the locations designated on the plans.

REMOVE IMPACT ATTENUATORS, NO SALVAGE

This work shall consist of the complete removal of the impact attenuators at the locations on Cook Street as shown on the plans. Concrete foundations shall be removed to at least one foot below final grade or to the satisfaction of the Engineer with all removed material to be disposed of according to Section 501.

All material, equipment and labor to perform this work shall be paid for at the contract unit price per each for REMOVE IMPACT ATTENUATORS, NO SALVAGE and shall be performed to the satisfaction of the Engineer.

SANDBLASTING CONCRETE

This work shall consist of sandblasting the existing retaining walls on South Grand Avenue and Cook Street. This work will be performed as follows:

1. Sandblast surface to remove all contaminates.
2. Scrub with an acid solution of 1-part muriatic acid to 10 parts water.
3. Neutralize with a mixture of 8 oz ammonia to 5 gallons of water.
4. Final pressure washing.

All material, equipment and labor to perform this work shall be paid for at the contract unit price per square yard for SANDBLASTING CONCRETE and shall be performed to the satisfaction of the Engineer.

SHOP DRAWING SUBMITTAL (STRUCTURAL ITEMS)

Description: This work shall consist of the submittal of shop drawings to the Engineer for review.

General: Shop drawing submittal shall be in accordance with this specification and Sections 105, 504, 505, 509, and 1042 of the Standard Specifications for Road and Bridge Construction.

Construction Requirements: The following items will require a shop drawing submittal to the Engineer for review.

- Structural Steel, Bearings and Anchor Bolts *
- Steel Railing (Special)
- Membrane Waterproofing (Special)*

* The Engineer will forward to the railroad agency for review.

Basis of Payment: This work will not be paid for separately but shall be included in the cost of the respective item.

STEEL RAILING (SPECIAL)

Description: This work shall consist of furnishing all labor, materials, and equipment for the fabrication and erection of the steel railing.

General: The railing shall be fabricated to comply with the requirements indicated on the design drawings. The railing shall be in accordance with this specification and applicable sections of Section 509 of the Standard Specifications for Road and Bridge Construction.

Construction Requirements: The contractor shall provide all necessary equipment for the installation of the steel railing.

All members supplied shall comply with the applicable ASTM standards.

HSS – ASTM A500, Grade B (46 ksi) (cold formed)

Plate – ASTM A36/A36M

Stainless Steel Strand and Fittings – ASTM A316

Galvanized Steel Anchor Rods – ASTM F1554

Washers for Steel Anchor Rods – ASTM F844 (Standard) or F436 (Hardened)

Nuts for Steel Anchor Rods – ASTM A583 Grade A

All railing components, with the exception of the stainless steel parts, shall be galvanized according to Section 509.05 of the Standard Specifications for Road and Bridge Construction and general notes shown on the plans. Galvanizing will not be measured for payment but included in the unit cost of this pay item.

Stainless steel strands and fittings shall be isolated from the galvanized posts and plates to prevent galvanic corrosion due to dissimilar materials.

Welding procedures and personnel shall be qualified according to AWS D1.1/D1.1M, “Structural Welding Code – Steel.”

Shop drawings shall include plans, elevations, sections, and detail views. Detail the posts, rails, strands and fittings. Indicate post and panel types, sizes, orientations and locations. Indicate critical dimensions from adjacent reveals, rustications and joints.

Indicate welded connections by AWS standard symbols. Detail loose and cast-in hardware, inserts, connections, and joints, including accessories.

Indicate locations and details of anchorage devices to be embedded in other construction. Coordinate with other trades to embed anchorages in other construction

Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 in. unless otherwise indicated. Remove sharp or rough areas on exposed surfaces. Provide a weep hole on the back face at the bottom of every HSS post.

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.

Intermediate tensioning posts shall be set at maximum of 70 ft spacing.

After threading strands through intermediate posts, hang a 20 pound weight at midpoint of the maximum post spacing on each strand prior to applying tension. Tension each strand to remove the sag to a maximum of 5/8 in.

Set railings accurately in location, alignment, and elevation. Set retaining wall posts plumb within a tolerance of 1/16 in. in 3 ft. Use post-installed chemical anchors for fastening the base plates to the concrete.

Method of Measurement: This work will be measured for payment in place in feet. The length measured will be the overall length along the top longitudinal railing member through all posts and small gaps.

Basis of Payment: This work will be paid for at the contract unit price per foot for STEEL RAILING (SPECIAL). Price shall be payment in full for all labor, materials, and equipment necessary to erect the steel railing.

CLEANING AND PAINTING EXISTING STEEL RAILING

Description: This work shall be in accordance with GBSP #25, Cleaning and Painting Existing Steel Structures, and will include the following items.

- Cleaning and painting of existing steel railing on the retaining walls at Cook Street within the limits shown on the plans.
- Cleaning and painting of new, replaced or altered sections of steel railing at Cook Street as shown on the plans.

Basis of Payment: This work shall be paid at the contract Lump Sum price for CLEANING AND PAINTING EXISTING STEEL RAILING.

ELECTRICAL

CONTRACT GUARANTEE

The Contractor shall guarantee all electrical equipment, apparatus, materials, and workmanship provided under the contract for a period of six (6) months after the date of final inspection according to Article 801.14.

All instruction sheets required to be furnished by the manufacturer for materials and supplies and for operations shall be delivered to the Engineer prior to the acceptance of the project, with the following warranties and guarantees:

1. The manufacturer's standard written warranty for each piece of electrical equipment or apparatus furnished under the contract.
2. The Contractor's written guarantee that, for a period of six (6) months after the date of final inspection of the project, all necessary repairs to or replacement of said warranted equipment, or apparatus shall be made by the Contractor at no cost to the Department.
3. The Contractor's written guarantee for satisfactory operation of all electrical systems furnished and constructed under the contract for a period of 6 months after final inspection of the project.

COBALT CONTROLLER

Revised: March 22, 2018

Description: This work shall consist of furnishing a shelf-mounted, two through sixteen-phase, fully-actuated, digital, solid-state traffic controller.

Controller:

The controller shall be an Econolite Cobalt C traffic controller and capable for integration into the existing District 6 ITS/ATMS network and shall be fully compatible with the District's Centrac's ATMS. The controllers shall be fully programmed upon installation. Econolite shall program the controllers using the existing intersection controllers programming data.

Description: The Contractor shall furnish the following equipment and install in the Cabinet:

Econolite shall provide support for controller programming, setup, testing, troubleshooting and integration. The IDOT District 6 Bureau of Operations, Traffic Signal Section, shall also provide support for integration of the intersection with the IDOT ATMS.

A shelf-mounted, two through sixteen phase, fully-actuated, digital, solid-state traffic controller. The controller shall be configurable to meet, as a minimum, all applicable sections of the NEMA

Standards Publications for TS2 and NTCIP 1202 and ATC standard 6.10. Where differences occur, these specifications shall govern. Controller versions shall be available to comply with NEMA TS2 Types 1 and 2. Type 2 versions of the controller shall be capable of operating as a Type 1 controller.

The controller shall require no more than 7" shelf depth. External dimensions shall not be larger than 8.5" x 15.2 1/4" x 6.375" (H x W x D).

The top and bottom of the chassis shall be made from extruded aluminum and include an integral handle on the back for easy transport. The sides shall be constructed of injection-molded polycarbonate. The model, serial number, and program information shall be displayed on the outside of the controller.

The electronics shall be modular in design and shall consist of vertical circuit boards. Horizontal circuit boards shall not be acceptable. In the interest of reliability, no sockets shall be used for any electronic device. All devices shall be directly soldered to the printed circuit board. Surface mount parts shall be used for the majority of the electronic components in the controller.

A built-in, high-efficiency switching power supply shall generate the primary, +5VDC internal voltage, an isolated +24 VDC for internal and external use, VSTANDBY, LINESYNC, POWERUP and POWERDOWN signals. All voltages shall be regulated. The 120 or 220VAC fuse shall be mounted on the front of the controller. Protection for the 24VDC supply shall be provided by a re-settable electronic fuse. All printed circuit boards shall meet the requirements of the NEMA Standard plus the following requirements to enhance reliability. Both sides of the printed circuit board shall be covered with a solder mask material. The circuit reference designation for all components and the polarity of all polarized capacitors and two-lead diodes shall be clearly marked adjacent to the component. Pin 1 for all integrated circuit packages shall be designated on all printed circuit boards. All printed circuit board assemblies shall be coated on both sides with a clear moisture-proof and fungus-proof sealant. Timing of the controller traffic application shall be derived from the AC power line.

To facilitate the transfer of user-programmed data from one controller to another, a Datakey receptacle for using a separate 2070-style, serial flash memory device shall be an available hardware option. In addition two USB sockets and one SD Card socket shall be provided for memory devices that can be used for data transfer. These data transfer devices shall be easily removable and directly accessible from the outside of the controller. The controller will not require this Datakey, USB memory thumb drive or SD Card to be present for proper operation. All controller software shall be stored in Flash Memory devices. The controller software shall be easily updated without the removal of any memory device from the controller. The use of removable PROMS or EPROMS from the controller shall not be acceptable. The controller shall include an option that allows updating software using a Windows based computer, a USB memory thumb drive or an SD card.

The controller shall include an ATC engine board compliant to ATC standard 5.2b and proposed version 6.10. The engine board shall include a PowerPC 83XX family processor with QUICC engine.

The engine board shall have a minimum of the following memory:

128Mbytes of DDR2 DRAM memory used for application and OS program execution
64 Mbytes of FLASH memory used for storage of OS Software and user applications
2MB of SRAM memory used for non-volatile parameter storage

The engine board shall provide the seven ATC serial ports, Ethernet, USB and all other control signal required by ATC standard. The operating system shall be Linux 2.6.35 or later

Program values shall be entered through the keypad. Menu selections shall be entered by entering the numerical value of the desired option.

The front of the controller shall consist of a panel for the display, keyboard and connectors for all necessary user connections. The display shall be a 7", TFT (Thin Film Transistor) LCD (Liquid Crystal Display) with high brightness. It shall be readable in direct sunlight. The display shall perform over the NEMA temperature range and shall have a resolution of 800 X 480. The luminous intensity shall be a minimum of 800 nits. The display shall not be affected by condensation or water drops.

Front-panel operator inputs shall be via clearly labeled elastomeric keypad. These shall include a 10-digit numeric keypad, Main and Sub keys, toggle keys, special function and enter keys, six function keys, status and help keys and a large, four-direction cursor control key.

The front panel shall include a built in speaker for enhanced controller audio feedback.

The front panel shall include a tri-color status LED.

The controller shall have the capability of supporting Ethernet communications, using TCP/IP communications protocols. The controller shall provide four front-panel Ethernet ports. Two of the ports shall be connected to Ethernet switch ENET1 and the other two shall be connected to Ethernet switch ENET2.

The controller shall provide two USB 2.0 ports. USB ports shall be used for USB thumb drives to update software, upload or download configuration or uploading logged data.

All non-optional interface connectors shall be accessible from the front of the controller in the NEMA Configured Controller models. Configurations shall be offered to accommodate different versions, as follows:

NEMA TS2 Type 1
NEMA TS2 Type 2
NEMA TS1

The D connector shall be compatible with the Econolite Model ASC/2, ASC/2S, and ASC/3 D connectors.

To facilitate special applications the controller shall have the capability of assignment of any input or output function to any input or output pin respectively on the interface connectors, with the exception of Flashing Monitor, Controller Voltage Monitor, AC+, AC-, Chassis Ground,

24VDC, Logic Ground and TS2 Mode bits.

The controller shall as a minimum have the following communications ports:

- Port 1 SDLC for communications to other devices in the cabinet
- Port 2 serial port for systems communications
- Console serial port for local communications

An optional telemetry module shall utilize TDM/FSK data transmission at 1200 baud or 9600 baud over two pairs of wires. This module shall include the Econolite 25-pin D-sub connector.

All electronic modules including the power supply shall be easily removable from the controller using a screwdriver as the only tool. All power and signal connections to the circuit boards shall be via plug-in connectors.

A Datakey and receptacle shall be available for use as a database storage device (backup) or as a database transfer module. It shall be capable of storing a minimum 2MB of data. The Datakey shall be hot swappable, so that it can be inserted and removed without powering down the controller. The Datakey shall be capable of storing the entire controller database and shall retain the information without use of battery or capacitor backup. The controller shall not require this key to be present during normal operation. If the Datakey is present the controller shall automatically backup the database to the data key 20 minutes following the last data change.

The controller shall provide support one ATC-2070 Type communications slot that can be added, if needed, providing access to ATC communications ports

Construction:

The Contractor shall coordinate the installation of the controllers with Econolite, the City of Springfield, Traffic Division and the IDOT District 6 Bureau of Operations, Traffic Signal Section.

Phone Numbers: **Paul Bullpit: 217-757-8515 (office); 217-303-6966 (cell)**
 T.J. Heavisides: 217-789-2255 (office); 217-381-3529 (cell)
 217-558-6718 (Stan Clow) or 217-558-6695 (Bill Shaw)

Basis of Payment: This work will be paid for at the contract unit price per each for COBALT CONTROLLER which price shall be payment in full for all labor, materials, support and equipment required to provide the equipment specified above and install and troubleshoot in the designated intersection cabinet.

ETHERNET SWITCH

Revised: March 22, 2018

Description: This work shall consist of providing a hardened Ethernet Switch, including the

applicable power supply. Two 10km single-mode fiber optic modules shall be supplied with each Ethernet switch.

The Contractor shall furnish the following equipment (MATERIAL ONLY) and deliver it to the IDOT District 6 Bureau of Operations, Traffic Signal Section:

There are no support requirements associated with this pay item.

The Ethernet Switch shall meet the following material specifications:

1. Overall switch station capacity and flexibility: Managed Gigabit Ethernet switch with 7 10/100BaseT(X) ports, and 3 10/100/1000BaseT(X) or 100/1000BaseSFP combo ports, with -40 to 75°C operating temperature. In addition, the switch shall include a SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, with -40 to 85°C operating temperature.
2. Cabling options: The switch shall be able to utilize a variety of connecting interfaces including 10/100Base(T)X, 10/100/1000Base(T)X, and 1000BaseSX/LX/LHX/ZX (LC connector).
3. Port configuration options: Port configurations shall be accessible via a standard web browser without requiring special vendor software. Port configuration changes shall be possible by personnel without special IT training. The configuration can be done via a console UI, telnet connection or command line interface. All T(X) ports shall provide cable autocross capability.

The Ethernet Switch shall be compatible with following network and software requirements:

1. Networking and Software: The Ethernet switches shall be IEEE802.3/802.3u/802.3ab/802.3z/802.3x/802.1D-2004/802.1w/802.1s/802.1Q/802.1p/802.1X/802.3ad compliant. The switch shall support the following standards and software interfaces:
 - a. Redundant fast/Gigabit Ethernet ring capability
 - b. IGMP Snooping and GMRP for filtering multicast traffic from industrial Ethernet protocols
 - c. Supports IEEE 802.1Q VLAN and GVRP protocol to ease network planning
 - d. Supports QoS-IEEE 802.1p/1Q and TOS/DiffServ to increase determinism
 - e. Supports 802.3ad, LACP for optimum bandwidth utilization
 - f. Supports TACACS+, SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
 - g. Support EtherNet/IP, PROFINET, and Modbus/TCP protocols for device management and monitoring
 - h. SNMPv1/v2c/v3 for different levels of network management security
 - i. Bandwidth management to prevent unpredictable network status
 - j. Lock port for authorized MAC address access only
 - k. Port mirroring for online debugging
 - l. Automatic warning by exception through e-mail, relay output
 - m. Digital inputs to integrate a sensor and alarm with an IP network

- n. Automatic recovery of connected device IP addresses
 - o. Line-swap fast recovery
2. Port Trunking for Flexible Network Connection: Maximum of four trunk groups for all Gigabit ports with maximum of 8 trunk ports for each trunk group shall be available. The user shall be able to either choose the type of the trunk group to be “Static” or “LACP.”
 3. IP Addressing Approach Options: IP addresses shall be set over the network using BootP/DHCP. The user shall have the capability to disable BootP or DHCP network based IP address changes. In addition, the switch shall support both a serial port and web page based manual (static) addressing approach.
 4. Ethernet Packet Transfer Accuracy and Capacity: The switch shall be capable of forwarding valid Ethernet frames using the store and forward method or equivalent method and the address table shall have a maximum capacity of 8192 addresses.
 5. Quality of Service Functions Enhance Determinism: The switches shall be able to read IEEE 802.1Q VLAN priority tags, and support a minimum of a low, normal, medium and high priority buffer. High priority messages shall be able to process before low priority messages. It also shall support QoS-IEEE 802.1p/1Q and TOS/DiffServ.
 6. SNMP Traps: The switches shall support sending SNMP messages to maximum 2 SNMP “Trap” server and The SNMP traps IP addresses shall be settable through a web browser interface.
 7. Multicast Message Control for Filtering Multicast Traffic: The switches shall be able to support IEEE 802.1D-1998 GMRP (GARP Multicast Registration Protocol), and IGMP (Internet Group Management Protocol).
 8. Port Access Control Enhances User Authentication: The switches shall support IEEE 802.1X and Static Port Lock for Port-Base Access Control.
 9. Accessible IP Settings: It shall allow the user to add or remove “Legal” remote host IP addresses to prevent unauthorized access. Access to switch shall be controlled by IP address. That is, if a host’s IP address is in the accessible IP table, then the host shall be allowed access to the switch.
 10. Additional network and software requirements shall be met:
 - a. IEEE 802.1X, HTTPS, and SSH to Enhance Network Security
 - b. Bandwidth Management Prevents Unpredictable Network Status
 - c. Port mirroring for Online Debugging
 - d. Automatic Warning by Exception through Email and Relay Output
 - e. Digital Inputs to Integrate Sensors and Alarms with IP Networks
 - f. Automatic Recovery of Connected Device’s IP Addresses
 - g. Line-swap Fast Recovery
 - h. Support EDS-SNMP OPC Server Pro

- i. Software based IEEE 1588 PTP (Precision Time Protocol) for precise time synchronization of networks
- j. DHCP Option 82 for IP address assignment with different policies
- k. Modbus/TCP / EtherNet/IP / PROFINET industrial Ethernet protocols supported
- l. Supports LLDP (Link Layer Discovery Protocol)
- m. Turbo Ring™ and Turbo Chain™ (< 20ms recovery time for fast Ethernet ports and < 50 ms recovery time for Gigabit Ethernet ports at full load) and STP/RSTP (IEEE 802.1w/D)

The Ethernet Switch shall meet the following general installation requirements:

1. Mounting: The switch shall be DIN-Rail or wall mountable
2. Power supply: Low voltage ranges: 12/24/48 VDC (9.6-60 VDC). In addition, a provision shall be made such that the loss of a power supply may be user configurable to trigger a hardware (i.e. relay contact), SNMP, e-mail and web page alarms.
3. Environmental specifications: Temperature & humidity - The switch shall have operating temperature ranges of -10 to 60°C or -40 to 75°C. In addition, the switch shall be rated to withstand a maximum continuous operating humidity of 95% without condensation.
4. Electrical Noise Immunity: The switch will conform to the IEC61000-4-2 to 4-8 series of noise specifications as specified below:

IEC 61000-4-2	Electrostatic Discharge: Criterion A
IEC 61000-4-3	Radiated Noise Immunity: Criterion A
IEC 61000-4-4	Fast Transient (Burst) Withstand: Criterion A
IEC 61000-4-5	Surge Voltage: Criterion A
IEC 61000-4-6	Conducted Noise Interference: Criterion A
IEC 61000-4-8	Electromagnetic Field withstand: Criterion A
IEC 61000-4-12	
IEC 61000-4-29	

5. Shock & Vibration: The operating shock rating shall conform to IEC60068-2-27 and withstand a 15 g, 11 ms duration, and 18 shocks. In addition, the operating vibration spec shall conform to IEC60068-2-6 (Criterion 3) at 1 mm, 2 Hz - 13.2 Hz, 90 min.; 0.7g, 13.2 Hz - 100 Hz, 90 min.; 3.5 mm, 3 Hz - 9 Hz, 10 cycles, 1 octave/min.; 1g, 9 Hz - 150 Hz, 10 cycles, 1 octave/min.
6. Switch shall be compliant with IEC 62443-4-2.

The Ethernet Switch shall meet the following hardware based diagnostics and user interfaces requirements:

1. Alarm contact: The switch shall contain an alarm contact that can be configured via standard web browser to annunciate the drop out of either or both power supply inputs

and/or to annunciate the active link status of any combination of ports. A Fault LED will be provided to indicate the status of the alarm contact.

2. LED Indications
3. Diagnostic display for internal switch status
4. Serial Port: The switch shall include a USB serial port that can be accessed by computers with hyper terminal or equivalent capability. The serial console connection manner shall require a short USB cable applied to connect the switch to a PC's USB port.

The Ethernet switch shall meet the following security requirements:

1. Port Disable: unused ports shall be able to be disabled to prevent unauthorized access.
2. It shall support IEEE 802.1X and SSL to enhance network security.
3. Switch configuration password protection
4. https/SSL

The Ethernet switch shall have following communication redundancy:

1. The switch shall be able to detect and compensate for the failure of another switch, cable disruption or hardware failure of one or more ports.
2. IEEE standards based redundancy, including IEEE 802.1D/W spanning tree
Turbo Ring: Gigabit Ethernet redundant ring capability (Turbo Ring V2: recovery time <20ms for fast Ethernet ports; < 50 ms for Gigabit Ethernet ports). Ring coupling function to integrate different Turbo Ring for distributed application
3. Turbo Chain function for a multiple-ring architecture (recovery time <20ms for fast Ethernet ports; <50 ms for Gigabit Ethernet ports)

The Ethernet switch shall be compatible with following software suite that assists with installation, operation, maintenance, and diagnostics of the existing network:

1. The switch must be compliant with a mass configuration tool:
 - a. The tool must contain a security wizard for convenient setup of security-related parameters.
 - b. The tool must allow for topology analysis to eliminate manual setting errors
 - c. The tool must contain a configuration overview for efficient management
2. The switch shall be compliant with network management software (NMS).
 - a. The NMS must allow for auto-discovery of network devices and physical connections.
 - b. The NMS must allow for event playback for quick troubleshooting
 - c. The NMS must allow for color-coded VLAN/IGMP groups and other visualized network data.

- d. The NMS must allow for a security view for the security status of network devices.
 - e. The NMS must support a mobile app for remote monitoring and notification.
3. The switch must be compliant with a stand-alone data collection tool to take network snapshots for quick troubleshooting.
- a. The collection tool must allow for the ability to compare network and device data and then highlight the differences.

Construction:

The Contractor shall deliver the Ethernet Switches, power supplies, and fiber optic modules, to the District 6 Bureau of Operations, Traffic Signal Section, 650 North Lincoln Avenue – Bldg. E, Springfield, IL. It is the Contractor's responsibility to coordinate the delivery location and time with District 6 Operations.

Phone Numbers: 217-558-6718 (Stan Clow) or 217-558-6695 (Bill Shaw)

Basis of Payment: This work will be paid for at the contract unit price per each for ETHERNET SWITCH which price shall be payment in full for all labor, materials, and equipment required to provide the equipment specified above and deliver it to the Department.

FIBER OPTIC CABLE 24 FIBERS, SINGLE MODE

Revised: March 22, 2018

This work shall be in accordance with Sections 801, 864, 871, and 1076 of the Standard Specifications except as modified herein.

Each cable shall be clearly labeled in each cabinet utilizing a durable computer-generated label. The label shall contain information regarding the locations to and from which the cable is installed. The Contractor shall provide numerical foot marking data at all handholes, vaults, cabinets, or enclosures to the Department.

12 of the fibers shall be terminated with LC connectors. All terminated fibers shall be clearly labeled pursuant to fiber color, termini locations, and buffer tubes.

Terminated fibers not being used shall be labeled "spare", and terminated fibers not attached to a distribution enclosure shall be capped and sealed, after testing.

All ancillary components required to complete the fiber optic cable plant, including but not limited to moisture and water sealants, cable caps, fan-out kits, weather-proof splice kits, boots, cable trays, splice enclosures, termination panels, etc., shall be supplied under this pay item and will not be paid for separately. These items shall be submitted to the Department for approval.

The fiber optic cable shall be clearly marked in each handhole, communication vault, or cabinet with a brightly colored (orange or yellow) weather resistant label securely attached to the cable.

The Contractor shall provide and install simultaneously with each new fiber optic cable installation a stranded and insulated 12 AWG (EPR-TYPE RHW or THHN) tracer cable. There will be no additional compensation for this work.

Materials.

The single-mode fiber optic cable shall incorporate a loose buffer-tube design. The cable shall conform to the requirements of RUS 7 CFR1755.900 (PE-90) for a single, sheathed, and non-armored cable and shall be new, unused, and of current design and manufacture.

Experience Requirements.

Personnel involved in the installation, splicing and testing of the fiber optic cables shall meet the following requirements:

The Contractor and the Contractor's fiber optic installation personnel shall have a minimum of 3 years' experience in the installation of fiber optic cables, including splicing, terminating, and testing single mode fibers.

The Contractor and the Contractor's fiber optic installation personnel shall have successfully and completely installed two outdoor fiber optic cable systems in conduit where the systems have been continuously and fully operational for at least two years. The Contractor shall submit the names, addresses, and telephone numbers of personnel who can be contacted regarding the installed fiber optic systems, along with photographs and other supporting documents pursuant to these installations, and shall plan to demonstrate one of these systems to Department representatives and the Engineer.

Installers shall be familiar with the cable manufacturer's recommended procedures for installing the cable. This shall include knowledge of splicing procedures for and equipment being used on this project and knowledge of all hardware such as furcation kits and splice closures. The Contractor shall submit documented cabling, testing, splicing, furcation, and other installation procedures to the Engineer for purposes of inspection and acceptance of the Contractor's work.

Personnel involved in testing shall have been trained by the manufacturer of the fiber optic cable test equipment to be used. Proof of this training shall be submitted to the Engineer for approval. The Contractor shall also submit documentation of the testing procedures for approval by the Engineer.

Installation in Conduit.

The Contractor shall ensure that the maximum cable bending radius is not exceeded during any unreeling, pulling, or installation operation. Entry guide chutes shall be used to guide the cable into handhole conduit ports. Lubricating compound shall be used to minimize friction. Corner

rollers (wheels), if used, shall not have effective radii greater than the maximum specified installation bending radius of the cable.

The pulling tension shall be continuously measured and shall not be allowed to exceed the maximum tension specified by the manufacturer of the cable. Fuse links and breaks can be used to ensure that the cable tensile strength is not exceeded. The pulling system shall have an audible alarm that sounds whenever a pre-selected tension level is reached. Tension levels shall be recorded continuously and shall be given to the Engineer upon request.

The cable shall be pulled into the conduit as a single component, absorbing the pulling force in all tension elements. The central strength member and aramid yarn shall be attached directly to the pulling eye during cable pulling. "Basket grip" or "Chinese-finger type" attachments, which only attach to the cable's outer jacket, shall not be permitted. A breakaway swivel, rated at 95% of the cable manufacturer's approved maximum tensile loading, shall be used on all pulls. When simultaneously pulling fiber optic cable with other cables, separate grooved rollers shall be used for each cable.

Splicing Requirements:

Splices shall be made at locations shown on the Plans. Any other splices shall be permitted only with the approval of the Engineer. The Contractor shall submit a splicing plan to the Department for approval.

Operation and Maintenance Documentation:

After the fiber optic cable plant has been installed, two (2) complete sets of Operation and Maintenance Documentation shall be provided. The documentation shall, as a minimum, include the following:

- Complete and accurate as-built diagrams showing the entire fiber optic cable plant including locations of all splices.
- Final copies of all approved test procedures.
- Complete performance data of the cable plant showing the losses at each terminal connector.
- Complete parts lists including names of vendors.
- Electronic Testing Files (OTDR traces, power meter data, etc.)

Testing Requirements:

Testing shall be in accordance with Article 801.13 except where modified by this special provision.

The Contractor shall submit detailed test procedures for approval by the Engineer. All continuous fiber runs shall be tested bi-directionally at both 1310 nm and 1550 nm with a power meter and optical source and OTDR. For testing, intermediate breakout fibers may be concatenated and tested end-to-end. Any discrepancies between the measured results and these specifications will be resolved to the satisfaction of the Engineer.

The Contractor shall provide the date, time and location of any tests required by this specification to the Engineer at least 5 days before performing the test. Upon completion of the cable installation, splicing, and termination, the Contractor shall test all fibers in each link for continuity and attenuation. The test procedure shall be as follows:

A Certified Technician utilizing an Optical Source/Power Meter and OTDR shall conduct the testing. The Technician is directed to conduct the test using the standard operating procedures defined by the manufacturer of the test equipment. All fibers installed shall be tested in both directions.

At the completion of the test, the Contractor shall provide two copies of documentation of the test results to the Engineer. The test documentation shall be bound and shall include the following:

Cable & Fiber Identification:

Cable ID
Cable Location - beginning and end
Fiber ID, including tube and fiber color
Operator Name
Date & Time
Setup Parameters
Wavelength
Pulse width (OTDR)
Refractory index (OTDR)
Range (OTDR)
Scale (OTDR)
Setup Option chosen to pass OTDR “dead zone”

Test Results:

Optical Source/Power Meter:

Total Attenuation (dB/km)

These results shall be provided in tabular form. The following shall be the criteria for the acceptance of the cable:

The test results shall show that the dB/km loss does not exceed +3% of the factory test or 1% of the cable's published production loss. However, no event shall exceed 0.10 dB. If any event is detected above 0.10 dB, the Contractor shall replace or repair the proposed fiber and/or fusion

splice and connector including that event point.

The total dB loss of the cable, less events, shall not exceed the manufacturer's production specifications as follows: 0.5 dB/km at both 1310 and 1550 nm.

If the total loss exceeds these specifications, the Contractor shall replace or repair that cable run at the Contractor's expense including both labor and materials. Elevated attenuation due to exceeding the pulling tension during installation shall require the replacement of the cable run at the Contractor's expense, including labor and materials.

The Contractor shall label the destination of each trunk cable onto the cable in each handhole and termination panel.

Slack Storage of Fiber Optic Cables:

A part of this pay item, slack fiber shall be supplied as necessary to allow splicing the fiber optic cables in a controlled environment, such as a splicing van or tent. After splicing has been completed, the slack fiber shall be stored underground in handholes and in the traffic controller cabinets.

Basis of Payment: This work will be paid for at the contract unit price per foot for FIBER OPTIC CABLE 24 FIBERS, SINGLE MODE and shall be payment in full for all labor, equipment, and material required to provide, install, terminate, splice, and test the fiber optic cable as described above.

JUNCTION BOX EMBEDDED IN STRUCTURE, SPECIAL

Description: This work shall consist of furnishing and installing a 6"x6"x4" stainless steel junction box or a stainless steel junction box of the size specified in the plans according to Section 813 of the of the SSRBC at locations as indicated on the plans.

Materials/Installation: The materials and installation shall be in accordance with Article 813 of the SSRBC.

Basis of Payment: The work will be paid for at the contract unit price per each for JUNCTION BOX EMBEDDED IN STRUCTURE, SPECIAL.

LIGHT POLE, ALUMINUM

Description: This work shall consist of furnishing and installing a light pole complete with an arm(s), when specified , and all hardware and accessories required for the intended permanent use of the pole according to Section 830 of the of the SSRBC at locations as indicated on the plans.

Materials/Installation: The materials and installation shall be in accordance with Article 830 of the SSRBC and Standard 830006 with the following exceptions.

Modify the Pole Lower Shaft table on Standard 830006 to include the following:

MOUNTING HEIGHT	LOWER SHAFT LENGTH	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
20'	11' – 1"	8 tapered to 6	0.25
25'	16' – 1"	8 tapered to 6	0.25

Manufacturers may provide alternative design at no additional cost to the contract.

Basis of Payment: The work will be paid for at the contract unit price per each for LIGHT POLE, ALUMINUM, mounting height, and arm (quantity and length) type specified.

LOCATION OF UNDERGROUND ELECTRICAL FACILITIES

Description: The Contractor shall be responsible for locating existing City of Springfield and CWLP facilities prior to performing any work. The Contractor shall also be liable for any damage to facilities resulting from inaccurate locating.

The Contractor may obtain, on request, plans for the existing electrical facilities from the agencies listed.

The Contractor shall also be responsible for locating and providing protection for facilities during all phases of construction. If at any time, the facilities are damaged, the Contractor shall immediately notify the Engineer and make all necessary arrangements for repair to the satisfaction of the Engineer.

Basis of Payment: This work will not be paid for separately but shall be included in the contract bid prices.

LUMINAIRE, DECORATIVE ELECTROLUMINESCENT LIGHT TAPE

Description: This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

Materials: The materials shall be in accordance with Article 821.02 of the “Standard Specifications”, plan details, and the following:

Luminaires shall have an Electroluminescent light engine. Luminaires will be mounted as detailed on the plans. The fixture shall be catalog number LT200-EXT-CLASSIC NATURAL

BLUE-LENGTH as shown on the plans as manufactured by Electro- LuminiX Lighting Corp.

The fixture shall have the following salient characteristics:

- Dimming comes Standard
- Energy Efficient
- UV and Moisture Resistant
- Available in Lengths up to 300 ft
- Highly Visible through smoke and fog
- Thin profile
- Generates No Heat and is cool to the touch
- 0.25 in. clear barrier encapsulation envelops the light engine on all four (4) sides
- 40,000 hour expected life
- Three (3) brightness settings
- 2 in. minimum width of lit area

Included with this pay item provide the power supply and power connector. Provide stainless steel NEMA 4X junction boxes to protect the power supply and power connector. Provide conduit between the power supply and power connection as detailed in the plans.

General: The work shall be completed in accordance with Section 821 of the “Standard Specifications”, plan details, and as modified herein.

Basis of Payment: The work will be paid for at the contract unit price per foot for LUMINAIRE, DECORATIVE ELECTROLUMINESCENT LIGHT TAPE. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

LUMINAIRE, LED, SPECIAL

Description: This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

Materials: The materials shall be in accordance with Article 821.02 of the “Standard Specifications”, plan details, and the following:

Luminaires shall have a 95 watt LED light engine. Luminaires on aluminum light poles with mast arms shall be catalog number LDRC-T2-E04-480-LCF as manufactured by LUMARK.

The fixture shall have the following salient characteristics:

- Heavy duty die cast aluminum housing
- Removable door
- 3G vibration tested
- Tool-less entry for enhanced maintenance
- High efficiency LED optics with 4000K light color
- Designed to withstand a 10kV transient line surge

- Optimized thermal management and heavy duty die cast heat sink.
- Low temperature operation down to -30 Degree C.
- 90 percent Lumen maintenance at 60,000 hours per IESNA TM-21
- Mounting to be two bolt / one bracket slip fitter design
- 5 Stage super TGIC polyester powder paint finish, 2.5 mil nominal thickness
- 5 year limited warranty

General: The work shall be completed in accordance with Section 821 of the “Standard Specifications”, plan details, and as modified herein.

Basis of Payment: The work will be paid for at the contract unit price per each for LUMINAIRE, LED, SPEICAL. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION C – TYPE 1

Description: This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

Materials: The materials shall be in accordance with Article 821.02 of the “Standard Specifications”, plan details, and the following:

Luminaires shall have a 48 watt LED light engine. Luminaires will be wall mounted in the recessed notch as detailed on the drawings. The fixture shall be catalog number 24320 LED K4-4000K Color, W/85CRI, SLV as manufactured by Bega.

The fixture shall have the following salient characteristics:

- Housing shall have die-cast aluminum end caps welded to an aluminum extrusion
- The welds are continuous end ground flat to provide a water tight housing
- Die castings are marine grade, copper free A360.0 aluminum alloy
- Fully gasketed with a molded silicone gasket
- ¼ in. tempered white glass lens
- LED light source to meet LM-70 requirements for lumen maintenance and life
- UL listed for wet location and 85 PSI hosedown
- IP-65 Rated
- 25 Year Warranty

As part of this pay item provide the necessary junction boxes within structure to facilitate routing the raceway from the light fixtures to the new lighting controller.

General: The work shall be completed in accordance with Section 821 of the “Standard Specifications,” plan details, and as modified herein.

Basis of Payment: The work will be paid for at the contract unit price per each for LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION C – TYPE 1. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION C – TYPE 2

Description: This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations as indicated on the plans.

Materials: The materials shall be in accordance with Article 821.02 of the “Standard Specifications”, plan details, and the following:

Luminaires shall have a 35 watt LED light engine. Luminaires will be wall mounted in the recessed notch as detailed on the drawings. The fixture shall be catalog number DSXW1-LED–20C-530-40k-T3M-MVOLT-BBW manufactured by Lithonia.

The fixture shall have the following salient characteristics:

- Housing shall have die-cast aluminum with integral heat sink fins
- The welds are continuous end ground flat to provide a water tight housing
- Precision-molded proprietary acrylic lenses.
- LED light source to meet LM-70 requirements for lumen maintenance and life
- UL listed for wet location and 85 PSI hosedown
- IP-65 Rated, housing sealed against moisture and environmental contaminates
- 25 Year Warranty

As part of this pay item provide the necessary junction boxes within structure to facilitate routing the raceway from the light fixtures to the new lighting controller.

General: The work shall be completed in accordance with Section 821 of the “Standard Specifications,” plan details, and as modified herein.

Basis of Payment: The work will be paid for at the contract unit price per each for LUMINAIRE, LED, UNDERPASS, WALLMOUNT, OUTPUT DESIGNATION C – Type 2. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

LUMINAIRE, LED, UNDERPASS, SUSPENDED, OUTPUT DESIGNATION B

Description: This work shall consist of furnishing all equipment, material and labor necessary to properly install the proposed luminaires at locations indicated on the plans.

Materials: The materials shall be in accordance with Article 821.02 of the “Standard Specifications”, plan details, and the following:

Luminaires shall have a 25 watt LED light engine. Luminaires will be suspended from the bridge above as detailed in the drawings. The fixture shall be catalog number DSXPG LED, 20c 350, 40k T5W MVOH lighting distribution as manufactured by Lithonia Lighting.

The fixture shall have the following salient characteristics:

- Two piece die-cast aluminum housing
- Integral heat sink fins
- Fully gasketed with molded silicone gasket
- LED light source to meet LM-70 requirements for lumen maintenance and life
- Electronic driver with a power factor > 90% and a THD of < 20%, 2.5kv surge rating
- UL listed for wet location
- IP-65 Rated

Power supply to the underside of the bridge shall be provided under other items of work. The underpass luminaire shall include a stainless steel junction box on the power supply conduit located along the edge of the bridge and all conduit, fittings, attachment hardware, cable, and stainless steel junction boxes needed to complete the circuit to the luminaire.

General: The work shall be completed in accordance with Section 821 of the “Standard Specifications”, plan details, and as modified herein.

Basis of Payment: The work will be paid for at the contract unit price per each for LUMINAIRE, LED, UNDERPASS, SUSPENED, OUTPUT DESIGNATION B. The unit price shall include the cost of all materials, equipment and labor required to furnish and install the luminaires.

MODIFY EXISTING CONTROLLER CABINET

Revised: March 22, 2018

This work shall consist of terminating, connecting, and testing newly-installed fiber optic cable in existing controller cabinets as indicated in the plans.

12 of 24 fibers within the single-mode cable shall be terminated with fusion-type LC connectors. The connectors shall meet TIA/EIA 568B specifications and shall have an operating temperature range of -10°C (14°F) to 60°C (140°F). The connectors shall be free from defects in material and manufacture for 6 months.

Breakout kits shall be provided for the separation and protection of individual fibers with buffer tubing and jacketing materials suitable for termination of the fiber with the fiber optic connectors. Stripped cable jackets shall be completely removed and all protective gel shall be cleaned from the loose tubes as recommended by the cable supplier.

Fiber optic cables shall be terminated in the controller cabinets within wall-mountable interconnection enclosures. The interconnection enclosures shall seal out dust and moisture and shall be sized sufficiently to store any and all fiber, windings, and splices. The dimensions of the enclosures shall not exceed 9.25" x 8.5" x 3". The enclosures shall accept 2 modular connector panels which shall be configured to accept 12 terminated single-mode fibers. These 12 single-mode user connection adapters shall be configured to accept LC patch cables. The location of the distribution enclosure shall not restrict access to existing traffic signal systems components. The single-mode field cable shall be firmly secured to the enclosure with appropriate and applicable clamping devices. The single-mode fiber optic cable shall leave the enclosure through rubber grommets or similar devices to protect the cable against wear. Slack fiber shall be neatly trained around the bottom perimeter of the cabinet.

All installed fiber optic cable shall be tested at its nominal operating wavelength and in accordance with Article 801. Additionally, detailed and complete post-installation power meter and OTDR test documentation shall be provided electronically to the Engineer to the satisfaction of the Engineer. The test data should be formatted as an Excel spreadsheet and may be either emailed to the Engineer for inspection and acceptance or provided on a thumb drive

Basis of Payment: This work will be paid for at the contract unit price each for MODIFY EXISTING CONTROLLER CABINET, which price shall be payment in full for installing the specified equipment and any incidental removal/replacement of existing equipment.

REMOVE FIBER OPTIC CABLE FROM CONDUIT

Description: This work shall consist of removing fiber optic cable from existing conduit and cleaning and swabbing existing conduit through which new fiber optic cable will be pulled.

The Contractor shall be responsible for repairing or replacing existing conduit or structures damaged during removal of the existing fiber optic cable.

The conduit shall be cleaned and swabbed in preparation for installation of new fiber optic cable.

The removed fiber optic cable shall be disposed of in a licensed landfill, recycled, reused, or otherwise disposed of as allowed by State or Federal laws and regulations.

Basis of Payment: This work will be paid for at the contract unit price per foot for REMOVE FIBER OPTIC CABLE FROM CONDUIT.

UNDERGROUND CONDUIT, COILABLE NONMETALLIC CONDUIT, 1 1/2" DIA.

Description: This work shall be in accordance with Section 810 of the Standard Specifications and the following additional requirements.

General: Existing handholes shall be drilled for installation of new conduit according to Section 879 of the Standard Specifications, and the abandoned penetration shall be sealed. If the existing

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penetration is suitable for reuse, the Contractor may remove the existing conduit and clean and prepare the existing penetration for installation of new conduit in lieu of drilling a new hole.

If the handhole is in a sidewalk area that is planned to remain, the entire sidewalk square or squares damaged by the work shall be replaced with new sidewalk.

Basis of Payment: This work will be paid for at the contract unit price per foot for UNDERGROUND CONDUIT, COILABLE NONMETALLIC CONDUIT, 1 1/2" DIA.

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (PROJECT SPECIFIC)

Description. This work shall be consist of the removal and disposal of regulated substances according to Section 669 of the Standard Specifications as revised below.

Contract Specific Sites. The excavation soil and groundwater within the areas listed below shall be managed as either “uncontaminated soil”, hazardous waste, special waste or non-special waste. For stationing, the lateral distance is measured is measured from centerline and the farthest distance is the offset distance or construction limit, whichever is less.

10th Street Rail Corridor, Norfolk Southern, Springfield, Sangamon County

- Station 47776+15 to Station 47777+00 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and arsenic.
- Station 47777+00 to Station 47778+10 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(b)(1). Contaminants of concern sampling parameters: pH.
- Station 47778+10 to Station 47781+12 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic.
- Station 47781+12 to Station 47782+15 (10th Street Rail Corridor), 0 to 170 feet LT, 0-10 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic.
- Station 47782+15 to Station 47783+17 (10th Street Rail Corridor), 0 to 170 feet LT, 5-10 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic.
- Station 47783+17 to Station 47784+17 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic.
- Station 47785+17 to Station 47786+17 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic.
- Station 47786+17 to Station 47787+18 (10th Street Rail Corridor), 0 to 170 feet LT, 5-10 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has

determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic.

- Station 47788+18 to Station 47789+20 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic and pH.
- Station 47789+20 to Station 47790+22 (10th Street Rail Corridor), 0 to 170 feet LT, 5-10 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic.
- Station 47790+22 to Station 47791+22 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(1). Contaminants of concern sampling parameters: arsenic and pH.
- Station 47791+22 to Station 47792+24 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameters: benzo(a)pyrene.
- Station 47792+24 to Station 47793+25 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic.
- Station 47793+25 to Station 47794+25 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(3). Contaminants of concern sampling parameters: benzo(a)pyrene.
- Station 47793+25 to Station 47794+25 (10th Street Rail Corridor), 0 to 170 feet LT, 5-10 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(2). Contaminants of concern sampling parameters: arsenic.
- Station 47794+25 to Station 47795+25 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(a)(5). Contaminants of concern sampling parameters: arsenic and pH.
- Station 47795+25 to Station 47796+27 (10th Street Rail Corridor), 0 to 170 feet LT, 0-5 feet BGS. All excavation planned for Drainage Ditch Excavation. The Engineer has determined this material meets to criteria of and shall be managed in accordance with Article 669.05(b)(1). Contaminants of concern sampling parameters: pH.

Work Zones

Three distinct OSHA HAZWOPER work zones (exclusion, decontamination, and support) shall apply to project adjacent to or within sites with documented leaking underground storage tank (LUST) incidents, or sites under management in accordance with the requirements of the Site Remediation Program (SRP), Resource Conservation and Recovery Act (RCRA), or Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), or as deemed necessary. For this project, the work zones apply for the following PESA Sites:

None

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STORM WATER POLLUTION PREVENTION PLAN

See following pages.



Route FAU 7985 A, FAU 7989	Marked Route Cook Street, South Grand Avenue	Section Number 19-00488-00-BR
Project Number ZOBP501	County Sangamon	Contract Number

This plan has been prepared to comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit No. ILR10 (Permit ILR10), issued by the Illinois Environmental Protection Agency (IEPA) for storm water discharges from construction site activities.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature <i>Nathan Bottom</i>	Date 1/19/2021
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Print Name Nathan Bottom	Title Public Works Director	Agency City of Springfield
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Note: Guidance on preparing each section of BDE 2342 can be found in Chapter 41 of the IDOT Bureau of Design and Environment (BDE) Manual. Chapter 41 and this form also reference the IDOT Drainage Manual which should be readily available.

I. Site Description:

A. Provide a description of the project location; include latitude and longitude, section, town, and range:

New railroad structures at the Cook Street and South Grand Avenue underpasses. Railroad grading, drainage and trackwork along the Norfolk Southern corridor from Capitol Avenue to south of South Grand Avenue. LAT 39 degrees 47' 41" LONG 89 degrees 38' 32"

B. Provide a description of the construction activity which is the subject of this plan. Include the number of construction stages, drainage improvements, in-stream work, installation, maintenance, removal of erosion measures, and permanent stabilization:

The project consists of constructing two new railroad structures at both the Cook Street and South Grand Avenue underpasses. A new wider rail corridor will be constructed from Capitol Avenue to south of South Grand Avenue. The project is a Usable Segment of the Springfield Rail Improvements Project.

C. Provide the estimated duration of this project:

24 months

D. The total area of the construction site is estimated to be 21 acres.

The total area of the site estimated to be disturbed by excavation, grading or other activities is 21 acres.

E. The following are weighted averages of the runoff coefficient for this project before and after construction activities are completed; see Section 4-102 of the IDOT Drainage Manual:

Rational "C" = 0.6

F. List all soils found within project boundaries; include map unit name, slope information, and erosivity:

Using the Web Soil Survey website (<http://websoilsurvey.sc.egov.usda.gov/App.WebSoilSurvey.aspx>) the following soil types were identified:

M.U.S. Description

43A Ipava silt loam, 0 to 2% slopes, a somewhat poorly drained soil with moderately high permeability

68A Sable silt clay loam, 0 to 2% slopes, a poorly drained soil with moderately high to high permeability

86B Osco silt loam 2% to 5% slopes well drained soil with moderately high permeability

533 Urban Land

See Attachment A for Soils Map

G. If wetlands were delineated for this project, provide an extent of wetland acreage at the site; see Phase I report:

Based on wetlands reconnaissance survey and the NWI mapping, this project does not affect any wetlands regulated under the Clean Water Act of 1972.

H. Provide a description of potentially erosive areas associated with this project:

Areas of exposed dirt from excavation operations.

I. The following is a description of soil disturbing activities by stages, their locations, and their erosive factors (e.g., steepness of slopes, length of slopes, etc.):

Construction along NSRR

Preliminary grading stage: Soil disturbing activities will consist of trenching for utilities, embankment construction and placing sub-ballast east of the existing tracks.

Final Grading Stage: Same as for preliminary grading except on the west side of the proposed track.

J. See the erosion control plans and/or drainage plans for this contract for information regarding drainage patterns, approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking (to be added after contractor identifies locations), areas of soil disturbance, the location of major structural and non-structural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands), and locations where storm water is discharged to surface water including wetlands.

K. Identify who owns the drainage system (municipality or agency) this project will drain into:

City of Springfield

L. The following is a list of General NPDES ILR40 permittees within whose reporting jurisdiction this project is located:

City of Springfield

Sangamon County Water Reclamation District

M. The following is a list of receiving water(s) and the ultimate receiving water(s) for this site. In addition, include receiving waters that are listed as Biologically Significant Streams by the Illinois Department of Natural Resources (IDNR). The location of the receiving waters can be found on the erosion and sediment control plans:

The receiving waters for the project are Sugar Creek which outlets to the Sangamon River.

N. Describe areas of the site that are to be protected or remain undisturbed. These areas may include steep slopes (i.e., 1:3 or steeper), highly erodible soils, streams, stream buffers, specimen trees, natural vegetation, nature preserves, etc. Include any commitments or requirements to protect adjacent wetlands.

For any storm water discharges from construction activities within 50-feet of Waters of the U.S. (except for activities for water-dependent structures authorized by a Section 404 permit, describe: a) How a 50-foot undisturbed natural buffer will be provided between the construction activity and the Waters of the U.S. or b) How additional erosion and sediment controls will be provided within that area.

There are no protected areas within or adjacent to the job site.

O. Per the Phase I document, the following sensitive environmental resources are associated with this project and may have the potential to be impacted by the proposed development. Further guidance on these resources is available in Section 41-4 of the BDE Manual.

- 303(d) Listed receiving waters for suspended solids, turbidity, or siltation.
The name(s) of the listed water body, and identification of all pollutants causing impairment:

Provide a description of how erosion and sediment control practices will prevent a discharge of sediment resulting from a storm event equal to or greater than a twenty-five (25) year, twenty-four (24) hour rainfall event:

Provide a description of the location(s) of direct discharge from the project site to the 303(d) water body:

Provide a description of the location(s) of any dewatering discharges to the MS4 and/or water body:

- Applicable Federal, Tribal, State, or Local Programs

- Floodplain

- Historic Preservation

- Receiving waters with Total Maximum Daily Load (TMDL) for sediment, total suspended solids, turbidity or siltation
TMDL (fill out this section if checked above)

The name(s) of the listed water body:

Provide a description of the erosion and sediment control strategy that will be incorporated into the site design that is consistent with the assumptions and requirements of the TMDL:

If a specific numeric waste load allocation has been established that would apply to the project's discharges, provide a description of the necessary steps to meet that allocation:

- Threatened and Endangered Species/Illinois Natural Areas (INAI)/Nature Preserves

- Other

- Wetland

P. The following pollutants of concern will be associated with this construction project:

Antifreeze / Coolants

Solid Waste Debris

- Concrete
- Concrete Curing Compounds
- Concrete Truck Waste
- Fertilizers / Pesticides
- Paints
- Petroleum (gas, diesel, oil, kerosene, hydraulic oil / fluids)
- Soil Sediment

- Solvents
- Waste water from cleaning construction equipments
- Other (Specify) _____

II. Controls:

This section of the plan addresses the controls that will be implemented for each of the major construction activities described in Section I.C above and for all use areas, borrow sites, and waste sites. For each measure discussed, the Contractor will be responsible for its implementation as indicated. The Contractor shall provide to the Resident Engineer a plan for the implementation of the measures indicated. The Contractor, and subcontractors, will notify the Resident Engineer of any proposed changes, maintenance, or modifications to keep construction activities compliant with the Permit ILR10. Each such Contractor has signed the required certification on forms which are attached to, and are a part of, this plan:

A. Erosion and Sediment Controls: At a minimum, controls must be coordinated, installed and maintained to:

1. Minimize the amount of soil exposed during construction activity;
2. Minimize the disturbance of steep slopes;
3. Maintain natural buffers around surface waters, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration, unless infeasible;
4. Minimize soil compaction and, unless infeasible, preserve topsoil.

B. Stabilization Practices: Provided below is a description of interim and permanent stabilization practices, including site- specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Stabilization practices may include but are not limited to: temporary seeding, permanent seeding, mulching, geotextiles, sodding, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. Except as provided below in II.B.1 and II.B.2, stabilization measures shall be initiated **immediately** where construction activities have temporarily or permanently ceased, but in no case more than **one (1) day** after the construction activity in that portion of the site has temporarily or permanently ceases on all disturbed portions of the site where construction will not occur for a period of fourteen (14) or more calendar days.

1. Where the initiation of stabilization measures is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.
2. On areas where construction activity has temporarily ceased and will resume after fourteen (14) days, a temporary stabilization method can be used.

The following stabilization practices will be used for this project:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Erosion Control Blanket / Mulching | <input type="checkbox"/> Temporary Turf (Seeding, Class 7) |
| <input type="checkbox"/> Geotextiles | <input type="checkbox"/> Temporary Mulching |
| <input checked="" type="checkbox"/> Permanent Seeding | <input type="checkbox"/> Vegetated Buffer Strips |
| <input type="checkbox"/> Preservation of Mature Seeding | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Protection of Trees | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Sodding | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Temporary Erosion Control Seeding | <input type="checkbox"/> Other (Specify) _____ |

Describe how the stabilization practices listed above will be utilized during construction:

Permanent seeding will be placed on bare slopes to prevent erosion. Erosion control blankets will be placed after seeding on 2:1 slopes.

Describe how the stabilization practices listed above will be utilized after construction activities have been completed:

Erosion control blankets will help prevent erosion until vegetation established.

C. Structural Practices: Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include but are not limited to: perimeter erosion barrier, earth dikes, drainage swales, sediment traps, ditch checks, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. The installation of these devices may be subject to Section 404 of the Clean Water Act.

- | | |
|--|---|
| <input type="checkbox"/> Aggregate Ditch | <input checked="" type="checkbox"/> Stabilized Construction Exits |
| <input type="checkbox"/> Concrete Revetment Mats | <input type="checkbox"/> Stabilized Trench Flow |
| <input type="checkbox"/> Dust Suppression | <input type="checkbox"/> Slope Mattress |
| <input type="checkbox"/> Dewatering Filtering | <input type="checkbox"/> Slope Walls |
| <input type="checkbox"/> Gabions | <input checked="" type="checkbox"/> Temporary Ditch Check |
| <input type="checkbox"/> In-Stream or Wetland Work | <input type="checkbox"/> Temporary Pipe Slope Drain |
| <input type="checkbox"/> Level Spreaders | <input type="checkbox"/> Temporary Sediment Basin |
| <input type="checkbox"/> Paved Ditch | <input type="checkbox"/> Temporary Stream Crossing |
| <input type="checkbox"/> Permanent Check Dams | <input type="checkbox"/> Turf Reinforcement Mats |
| <input checked="" type="checkbox"/> Perimeter Erosion Barrier | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Permanent Sediment Basin | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Retaining Walls | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Riprap | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Rock Outlet Protection | <input type="checkbox"/> Other (Specify) _____ |
| <input type="checkbox"/> Sediment Trap | <input type="checkbox"/> Other (Specify) _____ |
| <input checked="" type="checkbox"/> Storm Drain Inlet Protection | <input type="checkbox"/> Other (Specify) _____ |

Describe how the structural practices listed above will be utilized during construction:

The storm drain inlet protection will be placed at all the inlets and manholes along the rail corridor with open grates to prevent sediment and silt from construction operations from entering the storm sewer system. The inlet protection will consist of inlets filters. These inlet filters should be checked on a regular basis and maintained as necessary to ensure the proper function of each filter.

Describe how the structural practices listed above will be utilized after construction activities have been completed:

Once construction operations are completed and vegetation is sufficiently established to prevent erosion, the storm drain inlet filters can be removed.

The perimeter erosion barrier can be removed after exposed surfaces have been constructed to their final condition and all vegetation is sufficiently established to prevent sediment from flowing into the adjacent parking lots and roadways.

Broken concrete riprap will be placed at the South Grand Avenue pump station outlet in the detention ditch.

D. Treatment Chemicals

Will polymer flocculants or treatment chemicals be utilized on this project: Yes No

If yes above, identify where and how polymer flocculants or treatment chemicals will be utilized on this project.

E. Permanent (i.e., Post-Construction) Storm Water Management Controls: Provided below is a description of measures that will be installed during the construction process to control volume and pollutants in storm water discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Such practices may include but are not limited to: storm water detention structures (including wet ponds), storm water retention structures, flow attenuation by use of open vegetated swales and natural depressions, infiltration of runoff on site, and sequential systems (which combine several practices).

The practices selected for implementation were determined based on the technical guidance in Chapter 41 (Construction Site Storm Water Pollution Control) of the IDOT BDE Manual. If practices other than those discussed in Chapter 41 are selected for implementation or if practices are applied to situations different from those covered in Chapter 41, the technical basis for such decisions will be explained below.

2. Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., maintenance of hydrologic conditions such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

Description of permanent storm water management controls:

F. Approved State or Local Laws: The management practices, controls and provisions contained in this plan will be in accordance with IDOT specifications, which are at least as protective as the requirements contained in the IEPA's Illinois Urban Manual. Procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials shall be described or incorporated by reference in the space provided below. Requirements specified in sediment and erosion site plans, site permits, storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI, to be authorized to discharge under the Permit ILR10 incorporated by reference and are enforceable under this permit even if they are not specifically included in the plan.

Description of procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials:

G. Contractor Required Submittals: Prior to conducting any professional services at the site covered by this plan, the Contractor and each subcontractor responsible for compliance with the permit shall submit to the Resident Engineer a Contractor Certification Statement, BDE 2342A.

1. The Contractor shall provide a construction schedule containing an adequate level of detail to show major activities with implementation of pollution prevention BMPs, including the following items:

- Approximate duration of the project, including each stage of the project
- Rainy season, dry season, and winter shutdown dates
- Temporary stabilization measures to be employed by contract phases
- Mobilization time-frame
- Mass clearing and grubbing/roadside clearing dates
- Deployment of Erosion Control Practices
- Deployment of Sediment Control Practices (including stabilized cons

- Deployment of Construction Site Management Practices (including concrete washout facilities, chemical storage, refueling locations, etc.)
- Paving, saw-cutting, and any other pavement related operations
- Major planned stockpiling operation
- Time frame for other significant long-term operations or activities that may plan non-storm water discharges as dewatering, grinding, etc
- Permanent stabilization activities for each area of the project

2. During the pre-construction meeting, the Contractor and each subcontractor shall provide, as an attachment to their signed Contractor Certification Statement, a discussion of how they will comply with the requirements of the permit in regard to the following items and provide a graphical representation showing location and type of BMPs to be used when applicable:

- Temporary Ditch Checks - Identify what type and the source of Temporary Ditch Checks that will be installed as part of the project. The installation details will then be included with the SWPPP.
- Vehicle Entrances and Exits - Identify type and location of stabilized construction entrances and exits to be used and how they will be maintained.
- Material Delivery, Storage and Use - Discuss where and how materials including chemicals, concrete curing compounds, petroleum products, etc. will be stored for this project.
- Stockpile Management - Identify the location of both on-site and off-site stockpiles. Discuss what BMPs will be used to prevent pollution of storm water from stockpiles.
- Waste Disposal - Discuss methods of waste disposal that will be used for this project.
- Spill Prevention and Control - Discuss steps that will be taken in the event of a material spill (chemicals, concrete curing compounds, petroleum, etc.)
- Concrete Residuals and Washout Wastes - Discuss the location and type of concrete washout facilities to be used on this project and how they will be signed and maintained.
- Litter Management - Discuss how litter will be maintained for this project (education of employees, number of

- dumpsters, frequency of dumpster pick-up, etc.).
- Vehicle and Equipment Fueling - Identify equipment fueling locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Vehicle and Equipment Cleaning and Maintenance - Identify where equipment cleaning and maintenance locations for this project and what BMPs will be used to ensure containment and spill prevention.
- Dewatering Activities - Identify the controls which will be used during dewatering operations to ensure sediments will not leave the construction site.
- Polymer Flocculants and Treatment Chemicals - Identify the use and dosage of treatment chemicals and provide the Resident Engineer with Material Safety Data Sheets. Describe procedures on how the chemicals will be used and identify who will be responsible for the use and application of these chemicals. The selected individual must be trained on the established procedures.
- Additional measures indicated in the plan.

III. Maintenance:

When requested by the Contractor, the Resident Engineer will provide general maintenance guides (e.g., IDOT Erosion and Sediment Control Field Guide) to the Contractor for the practices associated with this project. Describe how all items will be checked for structural integrity, sediment accumulation and functionality. Any damage or undermining shall be repaired immediately. Provide specifics on how repairs will be made. The following additional procedures will be used to maintain, in good and effective operating conditions, the vegetation, erosion and sediment control measures and other protective measures identified in this plan. It will be the Contractor's responsibility to attain maintenance guidelines for any manufactured BMPs which are to be installed and maintained per manufacture's specifications.

IV. Inspections:

Qualified personnel shall inspect disturbed areas of the construction site including Borrow, Waste, and Use Areas, which have not yet been finally stabilized, structural control measures, and locations where vehicles and equipment enter and exit the site using IDOT Storm Water Pollution Prevention Plan Erosion Control Inspection Report, BC 2259. Such inspections shall be conducted at least once every seven (7) calendar days and within twenty-four (24) hours of the end of a storm or by the end of the following business or work day that is 0.5 inch or greater or equivalent snowfall.

Inspections may be reduced to once per month when construction activities have ceased due to frozen conditions. Weekly inspections will recommence when construction activities are conducted, or if there is 0.5" or greater rain event, or a discharge due to snowmelt occurs.

If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer shall notify the appropriate IEPA Field Operations Section office by email at: epa.swnoncomp@illinois.gov, telephone or fax within twenty-four (24) hours of the incident. The Resident Engineer shall then complete and submit an "Incidence of Non-Compliance" (ION) report for the identified violation within five (5) days of the incident. The Resident Engineer shall use forms provided by IEPA and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of non-compliance shall be signed by a responsible authority in accordance with Part VI. G of the Permit ILR10.

The Incidence of Non-Compliance shall be mailed to the following address:

Illinois Environmental Protection Agency
 Division of Water Pollution Control
 Attn: Compliance Assurance Section
 1021 North Grand East
 Post Office Box 19276
 Springfield, Illinois 62794-9276

V. Failure to Comply:

Failure to comply with any provisions of this Storm Water Pollution Prevention Plan will result in the implementation of a National Pollutant Discharge Elimination System/Erosion and Sediment Control Deficiency Deduction against the Contractor and/or penalties under the Permit ILR10 which could be passed on to the Contractor.

REVISE MAP LOCATION

Soil Map—Sangamon County, Illinois
(South Grand Ave. - S. 6th St Rail Corridor)



Map Scale: 1:11,000 if printed on B portrait (11" x 17") sheet.
0 150 300 600 900 Meters
0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



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Map Unit Legend

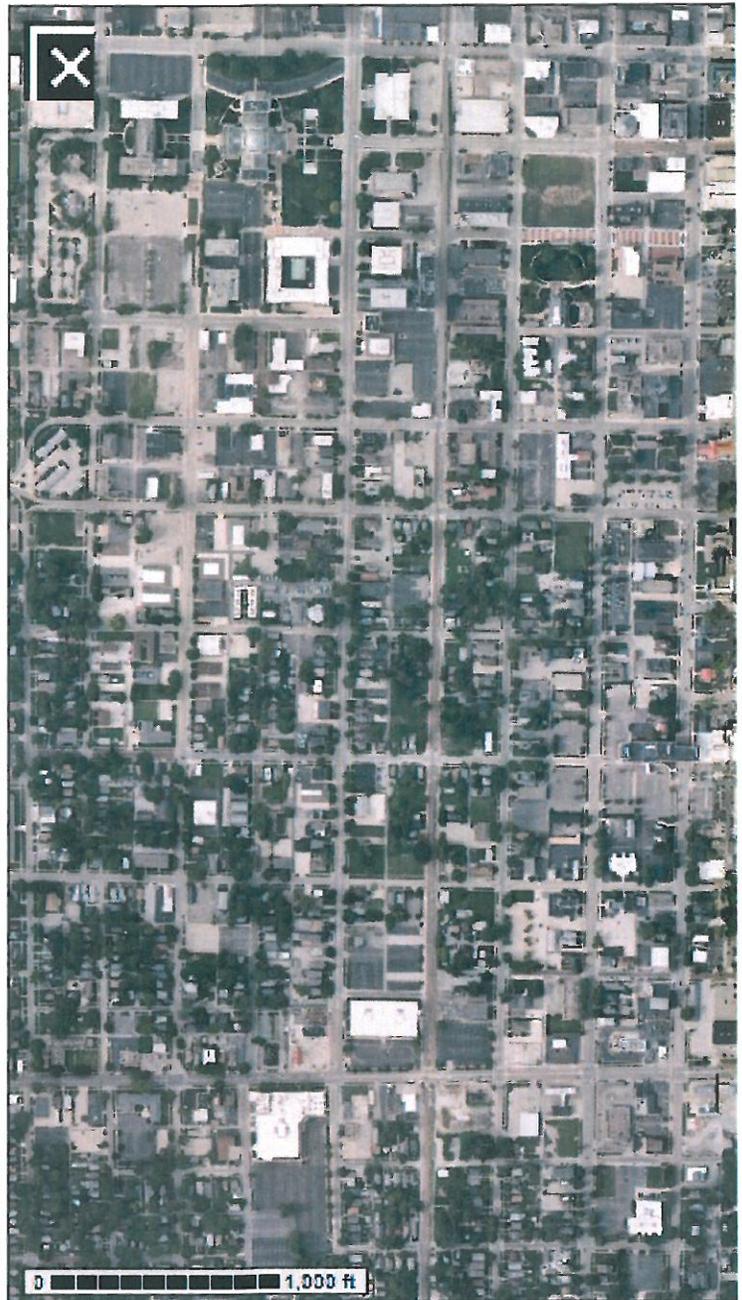
Sangamon County, Illinois (IL167)

Sangamon County, Illinois (IL167)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
43A	Ipava silt loam, 0 to 2 percent slopes	74.7	33.7%
68A	Sable silty clay loam, 0 to 2 percent slopes	27.7	12.5%
86B	Oscos silt loam, 2 to 5 percent slopes	14.1	6.3%
533	Urban land	105.5	47.5%
Totals for Area of Interest		222.1	100.0%

Soil Map

Scale (not to



PROJECT LABOR AGREEMENT

Effective: May 18, 2007

Revised: August 1, 2019

Description. The Illinois Project Labor Agreements Act, 30 ILCS 571, states that the State of Illinois has a compelling interest in awarding public works contracts so as to ensure the highest standards of quality and efficiency at the lowest responsible cost. A project labor agreement (PLA) is a form of pre-hire collective bargaining agreement covering all terms and conditions of employment on a specific project that is intended to support this compelling interest. It has been determined by the Department that a PLA is appropriate for the project that is the subject of this contract. The PLA document, provided below, only applies to the construction site for this contract. It is the policy of the Department on this contract, and all construction projects, to allow all contractors and subcontractors to compete for contracts and subcontracts without regard to whether they are otherwise parties to collective bargaining agreements.

Execution of Letter of Assent. A copy of the PLA applicable to this project is included as part of this special provision. As a condition of the award of the contract, the successful bidder and each of its subcontractors shall execute a "Contractor Letter of Assent", in the form attached to the PLA as Exhibit A. The successful bidder shall submit a Subcontractor's Contractor Letter of Assent to the Department prior to the subcontractor's performance of work on the project. Upon request, copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization at the pre-job conference.

Quarterly Reporting. Section 37 of the Illinois Project Labor Agreements Act requires the Department to submit quarterly reports regarding the number of minorities and females employed under PLAs. To assist in this reporting effort, the Contractor shall provide a quarterly workforce participation report for all minority and female employees working under the PLA of this contract. The data shall be reported on Construction Form BC 820, Project Labor Agreement (PLA) Workforce Participation Quarterly Reporting Form available on the Department's website <http://www.idot.illinois.gov/Assets/uploads/files/IDOT-Forms/BC/BC%20820.docx>.

The report shall be submitted no later than the 15th of the month following the end of each quarter (i.e., April 15 for the January – March reporting period). The form shall be emailed to DOT.PLA.Reporting@illinois.gov or faxed to (217) 524-4922.

Any costs associated with complying with this provision shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

Illinois Department of Transportation
PROJECT LABOR AGREEMENT

This Project Labor Agreement (“PLA” or “Agreement”) is entered into this _____ day of

_____, 2019, by and between the Illinois Department of Transportation (“IDOT” or “Department”) in its proprietary capacity, and each relevant Illinois AFL-CIO Building Trades signatory hereto as determined by the Illinois AFL-CIO Statewide Project Labor Agreement Committee on behalf of each of its affiliated members (individually and collectively, the “Unions”). This PLA shall apply to Construction Work (as defined herein) to be performed by IDOT’s Prime Contractor and each of its subcontractors of whatever tier (“Subcontractor” or “Subcontractors”) on Contract No. (hereinafter, the “Project”).

ARTICLE 1 - INTENT AND PURPOSES

- 1.1 This PLA is entered into in accordance with the Project Labor Agreement Act (“Act”, 30 ILCS 571). It is mutually understood and agreed that the terms and conditions of this PLA are intended to promote the public interest in obtaining timely and economical completion of the Project by encouraging productive and efficient construction operations; by establishing a spirit of harmony and cooperation among the parties; and by providing for peaceful and prompt settlement of any and all labor grievances or jurisdictional disputes of any kind without strikes, lockouts, slowdowns, delays, or other disruptions to the prosecution of the work. The parties acknowledge the obligations of the Contractors and Subcontractors to comply with the provisions of the Act. The parties will work with the Contractors and Subcontractors within the parameters of other statutory and regulatory requirements to implement the Act’s goals and objectives.
- 1.2 As a condition of the award of the contract for performance of work on the Project, IDOT’s Prime Contractor and each of its Subcontractors shall execute a “Contractor Letter of Assent”, in the form attached hereto as Exhibit A, prior to commencing Construction Work on the Project. The Contractor shall submit a Subcontractor’s Contractor Letter of Assent to the Department prior to the Subcontractor’s performance of Construction Work on the Project. Upon request copies of the applicable collective bargaining agreements will be provided by the appropriate signatory labor organization consistent with this Agreement and at the pre-job conference referenced in Article III, Section 3.1.

- 1.3 Each Union affiliate and separate local representing workers engaged in Construction Work on the Project in accordance with this PLA are bound to this agreement by the Illinois AFL-CIO Statewide Project Labor Agreement Committee which is the central committee established with full authority to negotiate and sign PLAs with the State on behalf of all respective crafts. Upon their signing the Contractor Letter of Assent, the Prime Contractor, each Subcontractor, and the individual Unions shall thereafter be deemed a party to this PLA. No party signatory to this PLA shall, contract or subcontract, nor permit any other person, firm, company, or entity to contract or subcontract for the performance of Construction Work for the Project to any person, firm, company, or entity that does not agree in writing to become bound for the term of this Project by the terms of this PLA prior to commencing such work and to the applicable area-wide collective bargaining agreement(s) with the Union(s) signatory hereto.
- 1.4 It is understood that the Prime Contractor(s) and each Subcontractor will be considered and accepted by the Unions as separate employers for the purposes of collective bargaining, and it is further agreed that the employees working under this PLA shall constitute a bargaining unit separate and distinct from all others. The parties hereto also agree that this PLA shall be applicable solely with respect to this Project, and shall have no bearing on the interpretation of any other collective bargaining agreement or as to the recognition of any bargaining unit other than for the specific purposes of this Project.
- 1.5 In the event of a variance or conflict, whether explicit or implicit, between the terms and conditions of this PLA and the provisions of any other applicable national, area, or local collective bargaining agreement, the terms and conditions of this PLA shall supersede and control. For any work performed under the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the National Agreement of the International Union of Elevator Constructors, and for any instrument calibration work and loop checking performed under the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, the preceding sentence shall apply only with respect to Articles I, II, V, VI, and VII.

- 1.6 Subject to the provisions of paragraph 1.5 of this Article, it is the parties' intent to respect the provisions of any other collective bargaining agreements that may now or hereafter pertain, whether between the Prime Contractor and one or more of the Unions or between a Subcontractor and one or more of the Unions. Accordingly, except and to the extent of any contrary provision set forth in this PLA, the Prime Contractor and each of its Subcontractors agrees to be bound and abide by the terms of the following in order of precedence: (a) the applicable collective bargaining agreement between the Prime Contractor and one or more of the Unions made signatory hereto; (b) the applicable collective bargaining agreement between a Subcontractor and one or more of the Unions made signatory hereto; or (c) the current applicable area collective bargaining agreement for the relevant Union that is the agreement certified by the Illinois Department of Labor for purposes of establishing the Prevailing Wage applicable to the Project. The Union will provide copies of the applicable collective bargaining agreements pursuant to part (c) of the preceding sentence to the Prime Contractor. Assignments by the Contractors or Subcontractors amongst the trades shall be consistent with area practices; in the event of unresolved disagreements as to the propriety of such assignments, the provisions of Article VI shall apply.
- 1.7 Subject to the limitations of paragraphs 1.4 to 1.6 of this Article, the terms of each applicable collective bargaining agreement as determined in accordance with paragraph 1.6 are incorporated herein by reference, and the terms of this PLA shall be deemed incorporated into such other applicable collective bargaining agreements only for purposes of their application to the Project.
- 1.8 To the extent necessary to comply with the requirements of any fringe benefit fund to which the Prime Contractor or Subcontractor is required to contribute under the terms of an applicable collective bargaining agreement pursuant to the preceding paragraph, the Prime Contractor or Subcontractor shall execute all "Participation Agreements" as may be reasonably required by the Union to accomplish such purpose; provided, however, that such Participation Agreements shall, when applicable to the Prime Contractor or Subcontractor solely as a result of this PLA, be amended as reasonably necessary to reflect such fact. Upon written notice in the form of a lien of a Contractor's or Subcontractor's delinquency from any applicable fringe benefit fund, IDOT will withhold from the Contractor's periodic pay request an amount sufficient to extinguish any delinquency obligation of the Contractor or Subcontractor arising out of the Project.
- 1.9 In the event that the applicable collective bargaining agreement between a Prime Contractor and the Union or between the Subcontractor and the Union expires prior to the completion of this Project, the expired applicable contract's terms will be maintained until a new applicable collective bargaining agreement is ratified. The wages and fringe benefits included in any new applicable collective bargaining agreement will apply on and after the effective date of the newly negotiated collective bargaining agreement, except to the extent wage and fringe benefit retroactivity is specifically agreed upon by the relevant bargaining parties.

ARTICLE II – APPLICABILITY, RECOGNITION, AND COMMITMENTS

- 2.1 The term Construction Work as used herein shall include all “construction, demolition, rehabilitation, renovation, or repair” work performed by a “laborer or mechanic” at the “site of the work” for the purpose of “building” the specific structures and improvements that constitute the Project. Terms appearing within quotation marks in the preceding sentence shall have the meaning ascribed to them pursuant to 29 CFR Part 5 and Illinois labor laws.
- 2.2 By executing the Letters of Assent, Prime Contractor and each of its Subcontractors recognizes the Unions signatory to this PLA as the sole and exclusive bargaining representatives for their craft employees employed on the jobsite for this Project. Unions who are signatory to this PLA will have recognition on the Project for their craft.
- 2.3 The Prime Contractor and each of its Subcontractors retains and shall be permitted to exercise full and exclusive authority and responsibility for the management of its operations, except as expressly limited by the terms of this PLA or by the terms and conditions of the applicable collective bargaining agreement.
- 2.4 Except to the extent contrary to an express provision of the relevant collective bargaining agreement, equipment or materials used in the Project may be pre-assembled or pre-fabricated, and there shall be no refusal by the Union to handle, transport, install, or connect such equipment or materials. Equipment or materials delivered to the job-site will be unloaded and handled promptly without regard to potential jurisdictional disputes; any such disputes shall be handled in accordance with the provisions of this PLA.
- 2.5 The parties are mutually committed to promoting a safe working environment for all personnel at the job-site. It shall be the responsibility of each employer to which this PLA applies to provide and maintain safe working conditions for its employees, and to comply with all applicable federal, state, and local health and safety laws and regulations.
- 2.6 The use or furnishing of alcohol or drugs and the conduct of any other illegal activity at the job-site is strictly prohibited. The parties shall take every practical measure consistent with the terms of applicable collective bargaining agreements to ensure that the job-site is free of alcohol and drugs.
- 2.7 All parties to this PLA agree that they will not discriminate against any employee based on race, creed, religion, color, national origin, union activity, age, gender or sexual orientation and shall comply with all applicable federal, state, and local laws.

- 2.8 In accordance with the Act and to promote diversity in employment, IDOT will establish, in cooperation with the other parties, the apprenticeship hours which are to be performed by minorities and females on the Project. IDOT shall consider the total hours to be performed by these underrepresented groups, as a percentage of the workforce, and create aspirational goals for each Project, based on the level of underutilization for the service area of the Project (together "Project Employment Objectives"). IDOT shall provide a quarterly report regarding the racial and gender composition of the workforce on the Project.

Persons currently lacking qualifications to enter apprenticeship programs will have the opportunity to obtain skills through basic training programs as have been established by the Department. The parties will endeavor to support such training programs to allow participants to obtain the requisite qualifications for the Project Employment Objectives.

The parties agree that all Contractors and Subcontractors working on the Project shall be encouraged to utilize the maximum number of apprentices as permitted under the terms of the applicable collective bargaining agreements to realize the Project Employment Objectives.

The Unions shall assist the Contractor and each Subcontractor in efforts to satisfy Project Employment Objectives. A Contractor or Subcontractor may request from a Union specific categories of workers necessary to satisfy Project Employment Objectives. The application of this section shall be consistent with all local Union collective bargaining agreements, and the hiring hall rules and regulations established for the hiring of personnel, as well as the apprenticeship standards set forth by each individual Union.

- 2.9 The parties hereto agree that engineering consultants and materials testing employees, to the extent subject to the terms of this PLA, shall be fully expected to objectively and responsibly perform their duties and obligations owed to the Department without regard to the potential union affiliation of such employees or of other employees on the Project.
- 2.10 This Agreement shall not apply to IDOT employees or employees of any other governmental entity.

ARTICLE III - ADMINISTRATION OF AGREEMENT

- 3.1 In order to assure that all parties have a clear understanding of the PLA, and to promote harmony, at the request of the Unions a post-award pre-job conference will be held among the Prime Contractor, all Subcontractors and Union representatives prior to the start of any Construction Work on the Project. No later than the conclusion of such pre-job conference, the parties shall, among other matters, provide to one another contact information for their respective representatives (including name, address, phone number, facsimile number, e-mail). Nothing herein shall be construed to limit the right of the Department to discuss or explain the purpose and intent of this PLA with prospective bidders or other interested parties prior to or following its award of the job.
- 3.2 Representatives of the Prime Contractor and the Unions shall meet as often as reasonably necessary following award until completion of the Project to assure the effective implementation of this PLA.
- 3.3 Any notice contemplated under Article VI and VII of this Agreement to a signatory labor organization shall be made in writing to the Local Union with copies to the local union's International Representative.

ARTICLE IV - HOURS OF WORK AND GENERAL CONDITIONS

- 4.1 The standard work day and work week for Construction Work on the Project shall be consistent with the respective collective bargaining agreements. In the event Project site or other job conditions dictate a change in the established starting time and/or a staggered lunch period for portions of the Project or for specific crafts, the Prime Contractor, relevant Subcontractors and business managers of the specific crafts involved shall confer and mutually agree to such changes as appropriate. If proposed work schedule changes cannot be mutually agreed upon between the parties, the hours fixed at the time of the pre-job meeting shall prevail.
- 4.2 Shift work may be established and directed by the Prime Contractor or relevant Subcontractor as reasonably necessary or appropriate to fulfill the terms of its contract with the Department. If used, shift hours, rates and conditions shall be as provided in the applicable collective bargaining agreement.
- 4.3 The parties agree that chronic and/or unexcused absenteeism is undesirable and must be controlled in accordance with procedures established by the applicable collective bargaining agreement. Any employee disciplined for absenteeism in accordance with such procedures shall be suspended from all work on the Project for not less than the maximum period permitted under the applicable collective bargaining agreement.

- 4.4 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, employment begins and ends at the Project site; employees shall be at their place of work at the starting time; and employees shall remain at their place of work until quitting time.
- 4.5 Except as may be otherwise expressly provided by the applicable collective bargaining agreement, there shall be no limit on production by workmen, no restrictions on the full use of tools or equipment, and no restrictions on efficient use of manpower or techniques of construction other than as may be required by safety regulations.
- 4.6 The parties recognize that specialized or unusual equipment may be installed on the Project. In such cases, the Union recognizes the right of the Prime Contractor or Subcontractor to involve the equipment supplier or vendor's personnel in supervising the setting up of the equipment, making modifications and final alignment, and performing similar activities that may be reasonably necessary prior to and during the start-up procedure in order to protect factory warranties. The Prime Contractor or Subcontractor shall notify the Union representatives in advance of any work at the job-site by such vendor personnel in order to promote a harmonious relationship between the equipment vendor's personnel and other Project employees.
- 4.7 For the purpose of promoting full and effective implementation of this PLA, authorized Union representatives shall have access to the Project job-site during scheduled work hours. Such access shall be conditioned upon adherence to all reasonable visitor and security rules of general applicability that may be established for the Project site at the pre-job conference or from time to time thereafter.

ARTICLE V – GRIEVANCE PROCEDURES FOR DISPUTES ARISING UNDER A PARTICULAR COLLECTIVE BARGAINING AGREEMENT

- 5.1 In the event a dispute arises under a particular collective bargaining agreement specifically not including jurisdictional disputes referenced in Article VI below, said dispute shall be resolved by the Grievance/Arbitration procedure of the applicable collective bargaining agreement. The resulting determination from this process shall be final and binding on all parties bound to its process.
- 5.2 Employers covered under this Agreement shall have the right to discharge or discipline any employee who violates the provisions of this Agreement. Such discharge or discipline by a contractor or subcontractor shall be subject to Grievance/Arbitration procedure of the applicable collective bargaining agreement only as to the fact of such violation of this agreement. If such fact is established, the penalty imposed shall not be disturbed. Work at the Project site shall continue without disruption or hindrance of any kind as a result of a Grievance/Arbitration procedure under this Article.

- 5.3 In the event there is a deadlock in the foregoing procedure, the parties agree that the matter shall be submitted to arbitration for the selection and decision of an Arbitrator governed under paragraph 6.8.

ARTICLE VI –DISPUTES: GENERAL PRINCIPLES

- 6.1 This Agreement is entered into to prevent strikes, lost time, lockouts and to facilitate the peaceful adjustment of jurisdictional disputes in the building and construction industry and to prevent waste and unnecessary avoidable delays and expense, and for the further purpose of at all times securing for the employer sufficient skilled workers.
- 6.2 A panel of Permanent Arbitrators are attached as addendum (A) to this agreement. By mutual agreement between IDOT and the Unions, the parties can open this section of the agreement as needed to make changes to the list of permanent arbitrators.

The arbitrator is not authorized to award back pay or any other damages for a miss assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an arbitrator.

- 6.3 The PLA Jurisdictional Dispute Resolution Process (“Process”) sets forth the procedures below to resolve jurisdictional disputes between and among Contractors, Subcontractors, and Unions engaged in the building and construction industry. Further, the Process will be followed for any grievance or dispute arising out of the interpretation or application of this PLA by the parties except for the prohibition on attorneys contained in 6.11. All decisions made through the Process are final and binding upon all parties.

DISPUTE PROCESS

- 6.4 Administrative functions under the Process shall be performed through the offices of the President and/or Secretary-Treasurer of the Illinois State Federation of Labor, or their designated representative, called the Administrator. In no event shall any officer, employee, agent, attorney, or other representative of the Illinois Federation of Labor, AFL- CIO be subject to any subpoena to appear or testify at any jurisdictional dispute hearing.
- 6.5 There shall be no abandonment of work during any case participating in this Process or in violation of the arbitration decision. All parties to this Process release the Illinois State Federation of Labor (“Federation”) from any liability arising from its action or inaction and covenant not to sue the Federation, nor its officers, employees, agents or attorneys.

- 6.6 In the event of a dispute relating to trade or work jurisdiction, all parties, including the employers, Contractors or Subcontractors, agree that a final and binding resolution of the dispute shall be resolved as follows:
- (a) Representatives of the affected trades and the Contractor or Subcontractor shall meet on the job site within two (2) business days after receiving written notice in an effort to resolve the dispute. (In the event there is a dispute between local unions affiliated with the same International Union, the decision of the General President, or his/her designee, as the internal jurisdictional authority of that International Union, shall constitute a final and binding decision and determination as to the jurisdiction of work.)
 - (b) If no settlement is achieved subsequent to the preceding Paragraph, the matter shall be referred to the local area Building & Construction Trades Council, which shall meet with the affected trades within two (2) business days subsequent to receiving written notice. In the event the parties do not wish to avail themselves of the local Building & Construction Trades Council, the parties may elect to invoke the services of their respective International Representatives with no extension of the time limitations. An agreement reached at this Step shall be final and binding upon all parties.
 - (c) If no settlement agreement is reached during the proceedings contemplated by Paragraphs "a" or "b" above, the matter shall be immediately referred to the Illinois Jurisdictional Dispute Process for final and binding resolution of said dispute. Said referral submission shall be in writing and served upon the Illinois State Federation of Labor, or the Administrator, pursuant to paragraph 6.4 of this agreement. The Administrator shall, within three (3) days, provide for the selection of an available Arbitrator to hear said dispute within this time period. Upon good cause shown and determined by the Administrator, an additional three (3) day extension for said hearing shall be granted at the sole discretion of the Administrator. Only upon mutual agreement of all parties may the Administrator extend the hearing for a period in excess of the time frames contemplated under this Paragraph. Business days are defined as Monday through Friday, excluding contract holidays.
- 6.7 The primary concern of the Process shall be the adjustment of jurisdictional disputes arising out of the Project. A sufficient number of Arbitrators shall be selected from list of approved Arbitrators as referenced Sec. 6.2 and shall be assigned per Sec. 6.8. Decisions shall be only for the Project and shall become effective immediately upon issuance and complied with by all parties. The authority of the Arbitrator shall be restricted and limited specifically to the terms and provisions of Article VI and generally to this Agreement as a whole.

- 6.8 Arbitrator chosen shall be randomly selected based on the list of Arbitrators in Sec. 6.2 and geographical location of the jurisdictional dispute and upon his/her availability, and ability to conduct a Hearing within two (2) business days of said notice. The Arbitrator may issue a “bench” decision immediately following the Hearing or he/she may elect to only issue a written decision, said decision must be issued within two (2) business days subsequent to the completion of the Hearing. Copies of all notices, pleadings, supporting memoranda, decisions, etc. shall be provided to all disputing parties and the Illinois State Federation of Labor.

Any written decision shall be in accordance with this Process and shall be final and binding upon all parties to the dispute and may be a “short form” decision. Fees and costs of the arbitrator shall be divided evenly between the contesting parties except that any party wishing a full opinion and decision beyond the short form decision shall bear the reasonable fees and costs of such full opinion. The decision of the Arbitrator shall be final and binding upon the parties hereto, their members, and affiliates.

In cases of jurisdictional disputes or other disputes between a signatory labor organization and another labor organization, both of which is an affiliate or member of the same International Union, the matter or dispute shall be settled in the manner set forth by their International Constitution and/or as determined by the International Union’s General President whose decision shall be final and binding upon all parties. In no event shall there be an abandonment of work.

- 6.9 In rendering a decision, the Arbitrator shall determine:
- (a) First, whether a previous agreement of record or applicable agreement, including a disclaimer agreement, between National or International Unions to the dispute or agreements between local unions involved in the dispute, governs;
 - (b) Only if the Arbitrator finds that the dispute is not covered by an appropriate or applicable agreement of record or agreement between the crafts to the dispute, he shall then consider the established trade practice in the industry and prevailing practice in the locality. Where there is a previous decision of record governing the case, the Arbitrator shall give equal weight to such decision of record, unless the prevailing practice in the locality in the past ten years favors one craft. In that case, the Arbitrator shall base his decision on the prevailing practice in the locality. Except, that if the Arbitrator finds that a craft has improperly obtained the prevailing practice in the locality through raiding, the undercutting of wages or by the use of vertical agreements, the Arbitrator shall rely on the decision of record and established trade practice in the industry rather than the prevailing practice in the locality; and,

- (c) Only if none of the above criteria is found to exist, the Arbitrator shall then consider that because efficiency, cost or continuity and good management are essential to the well being of the industry, the interests of the consumer or the past practices of the employer shall not be ignored.
 - (d) The arbitrator is not authorized to award back pay or any other damages for a mis-assignment of work. Nor may any party bring an independent action for back pay or any other damages, based upon a decision of an arbitrator.
- 6.10 The Arbitrator shall set forth the basis for his/her decision and shall explain his/her findings regarding the applicability of the above criteria. If lower ranked criteria are relied upon, the Arbitrator shall explain why the higher-ranked criteria were not deemed applicable. The Arbitrator's decision shall only apply to the Project. Agreements of Record, for other PLA projects, are applicable only to those parties signatory to such agreements. Decisions of Record are those that were either attested to by the former Impartial Jurisdictional Disputes Board or adopted by the National Arbitration Panel.
- 6.11 All interested parties, as determined by the Arbitrator, shall be entitled to make presentations to the Arbitrator. Any interested labor organization affiliated to the PLA Committee and party present at the Hearing, whether making a presentation or not, by such presence shall be deemed to accept the jurisdiction of the Arbitrator and to agree to be bound by its decision. In addition to the representative of the local labor organization, a representative of the labor organization's International Union may appear on behalf of the parties. Each party is responsible for arranging for its witnesses. In the event an Arbitrator's subpoena is required, the party requiring said subpoena shall prepare the subpoena for the Arbitrator to execute. Service of the subpoena upon any witness shall be the responsibility of the issuing party.

Attorneys shall not be permitted to attend or participate in any portion of a Hearing.

The parties are encouraged to determine, prior to Hearing, documentary evidence which may be presented to the Arbitrator on a joint basis.

- 6.12 The Order of Presentation in all Hearings before an Arbitrator shall be
- I. Identification and Stipulation of the Parties
 - II. Unions(s) claiming the disputed work presents its case
 - III. Union(s) assigned the disputed work presents its case
 - IV. Employer assigning the disputed work presents its case
 - V. Evidence from other interested parties (i.e., general contractor, project manager, owner)
 - VI. Rebuttal by union(s) claiming the disputed work
 - VII. Additional submissions permitted and requested by Arbitrator
 - VIII. Closing arguments by the parties

- 6.13 All parties bound to the provisions of this Process hereby release the Illinois State Federation of Labor and IDOT, their respective officers, agents, employees or designated representatives, specifically including any Arbitrator participating in said Process, from any and all liability or claim, of whatsoever nature, and specifically incorporating the protections provided in the Illinois Arbitration Act, as amended from time to time.
- 6.14 The Process, as an arbitration panel, nor its Administrator, shall have any authority to undertake any action to enforce its decision(s). Rather, it shall be the responsibility of the prevailing party to seek appropriate enforcement of a decision, including findings, orders or awards of the Arbitrator or Administrator determining non-compliance with a prior award or decision.
- 6.15 If at any time there is a question as to the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process, the primary responsibility for any determination of the arbitrability of a dispute and the jurisdiction of the Arbitrator shall be borne by the party requesting the Arbitrator to hear the underlying jurisdictional dispute. The affected party or parties may proceed before the Arbitrator even in the absence or one or more stipulated parties with the issue of jurisdiction as an additional item to be decided by the Arbitrator. The Administrator may participate in proceedings seeking a declaration or determination that the underlying dispute is subject to the jurisdiction and process of the Illinois Jurisdictional Dispute Resolution Process. In any such proceedings, the non-prevailing party and/or the party challenging the jurisdiction of the Illinois Jurisdictional Dispute Resolution Process shall bear all the costs, expenses and attorneys' fees incurred by the Illinois Jurisdictional Dispute Resolution Process and/or its Administrator in establishing its jurisdiction.

ARTICLE VII - WORK STOPPAGES AND LOCKOUTS

- 7.1 During the term of this PLA, no Union or any of its members, officers, stewards, employees, agents or representatives shall instigate, support, sanction, maintain, or participate in any strike, picketing, walkout, work stoppage, slow down or other activity that interferes with the routine and timely prosecution of work at the Project site or at any other contractor's or supplier's facility that is necessary to performance of work at the Project site. Hand billing at the Project site during the designated lunch period and before commencement or following conclusion of the established standard workday shall not, in itself, be deemed an activity that interferes with the routine and timely prosecution of work on the Project.

7.2 Should any activity prohibited by paragraph 7.1 of this Article occur, the Union shall undertake all steps reasonably necessary to promptly end such prohibited activities.

7.2.A No Union complying with its obligations under this Article shall be liable for acts of employees for which it has no responsibility or for the unauthorized acts of employees it represents. Any employee who participates or encourages any activity prohibited by paragraph 7.1 shall be immediately suspended from all work on the Project for a period equal to the greater of (a) 60 days; or (b) the maximum disciplinary period allowed under the applicable collective bargaining agreement for engaging in comparable unauthorized or prohibited activity.

7.2.B Neither the PLA Committee nor its affiliates shall be liable for acts of employees for which it has no responsibility. The principal officer or officers of the PLA Committee will immediately instruct, order and use the best efforts of his office to cause the affiliated union or unions to cease any violations of this Article. The PLA Committee in its compliance with this obligation shall not be liable for acts of its affiliates. The principal officer or officers of any involved affiliate will immediately instruct, order or use the best effort of his office to cause the employees the union represents to cease any violations of this Article. A union complying with this obligation shall not be liable for unauthorized acts of employees it represents. The failure of the Contractor to exercise its rights in any instance shall not be deemed a waiver of its rights in any other instance.

During the term of this PLA, the Prime Contractor and its Subcontractors shall not engage in any lockout at the Project site of employees covered by this Agreement.

7.3 Upon notification of violations of this Article, the principal officer or officers of the local area Building and Construction Trades Council, and the Illinois AFL-CIO Statewide Project Labor Agreement Committee as appropriate, will immediately instruct, order and use their best efforts to cause the affiliated union or unions to cease any violations of this Article. A Trades Council and the Committee otherwise in compliance with the obligations under this paragraph shall not be liable for unauthorized acts of its affiliates.

7.4 In the event that activities in violation of this Article are not immediately halted through the efforts of the parties, any aggrieved party may invoke the special arbitration provisions set forth in paragraph 7.5 of this Article.

- 7.5 Upon written notice to the other involved parties by the most expeditious means available, any aggrieved party may institute the following special arbitration procedure when a breach of this Article is alleged:
- 7.5.A The party invoking this procedure shall notify the individual designated as the Permanent Arbitrator pursuant to paragraph 6.8 of the nature of the alleged violation; such notice shall be by the most expeditious means possible. The initiating party may also furnish such additional factual information as may be reasonably necessary for the Permanent Arbitrator to understand the relevant circumstances. Copies of any written materials provided to the arbitrator shall also be contemporaneously provided by the most expeditious means possible to the party alleged to be in violation and to all other involved parties.
- 7.5.B Upon receipt of said notice the Permanent Arbitrator shall set and hold a hearing within twenty-four (24) hours if it is contended the violation is ongoing, but not before twenty-four (24) hours after the written notice to all parties involved as required above.
- 7.5.C The Permanent Arbitrator shall notify the parties by facsimile or any other effective written means, of the place and time chosen by the Permanent Arbitrator for this hearing. Said hearing shall be completed in one session. A failure of any party or parties to attend said hearing shall not delay the hearing of evidence or issuance of an Award by the Permanent Arbitrator.
- 7.5.D The sole issue at the hearing shall be whether a violation of this Article has, in fact, occurred. An Award shall be issued in writing within three (3) hours after the close of the hearing, and may be issued without a written opinion. If any party desires a written opinion, one shall be issued within fifteen (15) days, but its issuance shall not delay compliance with, or enforcement of, the Award. The Permanent Arbitrator may order cessation of the violation of this Article, and such Award shall be served on all parties by hand or registered mail upon issuance.
- 7.5.E Such Award may be enforced by any court of competent jurisdiction upon the filing of the Award and such other relevant documents as may be required. Facsimile or other hardcopy written notice of the filing of such enforcement proceedings shall be given to the other relevant parties. In a proceeding to obtain a temporary order enforcing the Permanent Arbitrator's Award as issued under this Article, all parties waive the right to a hearing and agree that such proceedings may be ex parte. Such agreement does not waive any party's right to participate in a hearing for a final order of enforcement. The Court's order or orders enforcing the Permanent Arbitrator's Award shall be served on all parties by hand or by delivery to their last known address or by registered mail.

- 7.6 Individuals found to have violated the provisions of this Article are subject to immediate termination. In addition, IDOT reserves the right to terminate this PLA as to any party found to have violated the provisions of this Article.
- 7.7 Any rights created by statute or law governing arbitration proceedings inconsistent with the above procedure or which interfere with compliance therewith are hereby waived by parties to whom they accrue.
- 7.8 The fees and expenses of the Permanent Arbitrator shall be borne by the party or parties found in violation, or in the event no violation is found, such fees and expenses shall be borne by the moving party.

ARTICLE VIII – TERMS OF AGREEMENT

- 8.1 If any Article or provision of this Agreement shall be declared invalid, inoperative or unenforceable by operation of law or by any of the above mentioned tribunals of competent jurisdiction, the remainder of this Agreement or the application of such Article or provision to persons or circumstances other than those as to which it has been held invalid, inoperative or unenforceable shall not be affected thereby.
- 8.2 This Agreement shall be in full force as of and from the date of the Notice of Award until the Project contract is closed.
- 8.3 This PLA may not be changed or modified except by the subsequent written agreement of the parties. All parties represent that they have the full legal authority to enter into this PLA. This PLA may be executed by the parties in one or more counterparts.
- 8.4 Any liability arising out of this PLA shall be several and not joint. IDOT shall not be liable to any person or other party for any violation of this PLA by any other party, and no Contractor or Union shall be liable for any violation of this PLA by any other Contractor or Union.
- 8.5 The failure or refusal of a party to exercise its rights hereunder in one or more instances shall not be deemed a waiver of any such rights in respect of a separate instance of the same or similar nature.

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Addendum A

IDOT Slate of Permanent Arbitrators

1. Bruce Feldacker
2. Thomas F. Gibbons
3. Edward J. Harrick
4. Brent L. Motchan
5. Robert Perkovich
6. Byron Yaffee
7. Glenn A. Zipp

Execution Page

Illinois Department of Transportation

VACANT

Director of Highways Project Implementation

Director of Finance & Administration

Philip Kaufmann, Chief Counsel

Omer Osman, Acting Secretary

(Date)

Illinois AFL-CIO Statewide Project Labor Agreement Committee, representing the Unions listed below:

(Date)

List Unions:

Exhibit A - Contractor Letter of Assent

(Date)

To All Parties:

In accordance with the terms and conditions of the contract for Construction Work on [Contract No.], this Letter of Assent hereby confirms that the undersigned Prime Contractor or Subcontractor agrees to be bound by the terms and conditions of the Project Labor Agreement established and entered into by the Illinois Department of Transportation in connection with said Project.

It is the understanding and intent of the undersigned party that this Project Labor Agreement shall pertain only to the identified Project. In the event it is necessary for the undersigned party to become signatory to a collective bargaining agreement to which it is not otherwise a party in order that it may lawfully make certain required contributions to applicable fringe benefit funds, the undersigned party hereby expressly conditions its acceptance of and limits its participation in such collective bargaining agreement to its work on the Project.

(Authorized Company Officer)

(Company)

BLENDED FINELY DIVIDED MINERALS (BDE)

Effective: April 1, 2021

Revise the second paragraph of Article 1010.01 of the Standard Specifications to read:

“Different sources or types of finely divided minerals shall not be mixed or used alternately in the same item of construction, except as a blended finely divided mineral product according to Article 1010.06.”

Add the following article to Section 1010 of the Standard Specifications:

“1010.06 Blended Finely Divided Minerals. Blended finely divided minerals shall be the product resulting from the blending or intergrinding of two or three finely divided minerals. Blended finely divided minerals shall be according to ASTM C 1697, except as follows.

- (a) Blending shall be accomplished by mechanically or pneumatically intermixing the constituent finely divided minerals into a uniform mixture that is then discharged into a silo for storage or tanker for transportation.
- (b) The blended finely divided mineral product will be classified according to its predominant constituent or the manufacturer’s designation and shall meet the chemical requirements of its classification. The other finely divided mineral constituent(s) will not be required to conform to their individual standards.”

80436

**BUILDING REMOVAL - CASE I (NON-FRIABLE AND FRIABLE ASBESTOS ABATEMENT)
(BDE)**

Effective: September 1, 1990

Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 1 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

<u>Bldg. No.</u>	<u>Parcel No.</u>	<u>Location</u>	<u>Description</u>
3	SR0135	709 BARRETT ST	Multiple steel and wood framed buildings with block, brick and metal exterior finish, low-pitch EDPM and gabled metal roofs, and concrete floors/foundations. The building includes structural support for a 5-ton overhead rolling crane.

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

All friable asbestos shall be removed from the building(s) prior to demolition. The Contractor has the option of removing the non-friable asbestos prior to demolition or demolishing the building(s) with the non-friable asbestos in place. Refer to the Special Provisions titled "Asbestos Abatement (General Conditions)", "Removal and Disposal of Friable Asbestos Building No. 3", and "Removal and Disposal of Non-Friable Asbestos Building No. 3" contained herein.

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition and disposal assuming all asbestos, friable and non-friable, is removed prior to demolition. Any salvage value shall be reflected in the contract unit price for this item.

EXPLANATION OF BIDDING TERMS: Three separate contract unit price items have been established for the removal of each building. They are:

1. BUILDING REMOVAL NO. 3
2. REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 3
3. REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 3

The Contractor shall have two options available for the removal and disposal of the non-friable asbestos.

The pay item for removal and disposal of non-friable asbestos will not be deleted regardless of the option chosen by the Contractor.

ASBESTOS ABATEMENT (GENERAL CONDITIONS): This work consists of the removal and disposal of friable and non-friable asbestos from the building(s) to be demolished. All work shall be done according to the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), the Special Provisions for "Removal and Disposal of Friable Asbestos, Building No. 3" and "Removal and Disposal of Non-Friable Asbestos, Building No. 3", and as outlined herein.

Sketches indicating the location of Asbestos Containing Material (ACM) are included in the proposal on pages _____ thru _____. Also refer to the Materials Description Table on page _____ for a brief description and location of the various materials. Also included is a Materials Quantities Table on page _____. This table states whether the ACM is friable or non-friable and gives the approximate quantity. The quantities are given only for information and it shall be the Contractor's responsibility to determine the exact quantities prior to submitting his/her bid.

The work involved in the removal and disposal of friable asbestos, and non-friable asbestos if done prior to demolition, shall be performed by a Contractor or Sub-Contractor prequalified with the Illinois Capital Development Board.

The Contractor shall provide a shipping manifest, similar to the one shown on page _____, to the Engineer for the disposal of all ACM wastes.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work shall be the responsibility of the Contractor. Copies of these permits shall be sent to the district office and the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any asbestos removal or demolition activity. Separate notices shall be sent for the asbestos removal work and the building demolition if they are done as separate operations.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217)785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

- A. All submittals and notices shall be made to the Engineer, except where otherwise specified herein.
- B. Submittals that shall be made prior to start of work:
 1. Submittals required under Asbestos Abatement Experience.
 2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.
 3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.

4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.
 5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).
 6. Submit a list of penalties, including liquidated damages, incurred through non-compliance with asbestos abatement project specifications.
 7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.
 8. Submit proof of written notification and compliance with Paragraph "Notifications".
- C. Submittals that shall be made upon completion of abatement work:
1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;
 2. Submit daily copies of work site entry logbooks with information on worker and visitor access;
 3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and
 4. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance:

- A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.
- B. The Contractor shall document current Workmen's Compensation Insurance coverage.
- C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience:

- A. Company Experience: Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.
- B. Personnel Experience:
 - 1. For Superintendent, the Contractor shall supply:
 - a. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.
 - b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.
 - 2. For workers involved in the removal of friable and non-friable asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who will be working on this project.

ABATEMENT AIR MONITORING: The Contractor shall comply with the following:

- A. Personal Monitoring: All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted according to 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits shall be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.
- B. Contained Work Areas for Removal of Friable Asbestos: Area samples shall be collected for the department within the work area daily. A minimum of one sample shall be taken outside of the abatement area removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.
- C. Interior Non-Friable Asbestos-Containing Materials: The Contractor shall perform personal air monitoring during removal of all nonfriable Transite and floor tile removal

operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.

- D. Exterior Non-Friable Asbestos-Containing Materials: The Contractor shall perform personal air monitoring during removal of all nonfriable cementitious panels, piping, roofing felts, and built up roofing materials that contain asbestos.

The Contractor shall conduct down wind area sampling to monitor airborne fiber levels at a frequency of no less than three per day.

E. Air Monitoring Professional

1. All air sampling shall be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional shall submit documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".
2. Air sampling shall be conducted according to NIOSH Method 7400. The results of these tests shall be provided to the Engineer within 24 hours of the collection of air samples.

REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 3: This work consists of the removal and disposal of all friable asbestos from the building(s) prior to demolition. The work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)" and as outlined herein.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 3, as shown, which price shall include furnishing all labor, materials, equipment and services required to remove and dispose of the friable asbestos.

REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 3: The Contractor has the option of removing and disposing of the non-friable asbestos prior to demolition of the building(s) or demolishing the building(s) with the non-friable asbestos in place.

Option #1 - If the Contractor chooses to remove all non-friable asbestos prior to demolition, the work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)".

Option #2 - If the Contractor chooses to demolish the building(s) with the non-friable asbestos in place, the following provisions shall apply:

1. Continuously wet all non-friable ACM and other building debris with water during demolition.

2. Dispose of all demolition debris as asbestos containing material by placing it in lined, covered transport haulers and placing it in an approved landfill.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 3, as shown.

The cost for this work shall be determined as follows:

Option #1 - Actual cost of removal and disposal of non-friable asbestos.

Option #2 - The difference in cost between removing and disposing of the building if all non-friable asbestos is left in place and removing and disposing of the building assuming all non-friable asbestos is removed prior to demolition.

The cost of removing and disposing of the building(s), assuming all asbestos, friable and non-friable is removed first, shall be represented by the pay item "BUILDING REMOVAL NO. 3".

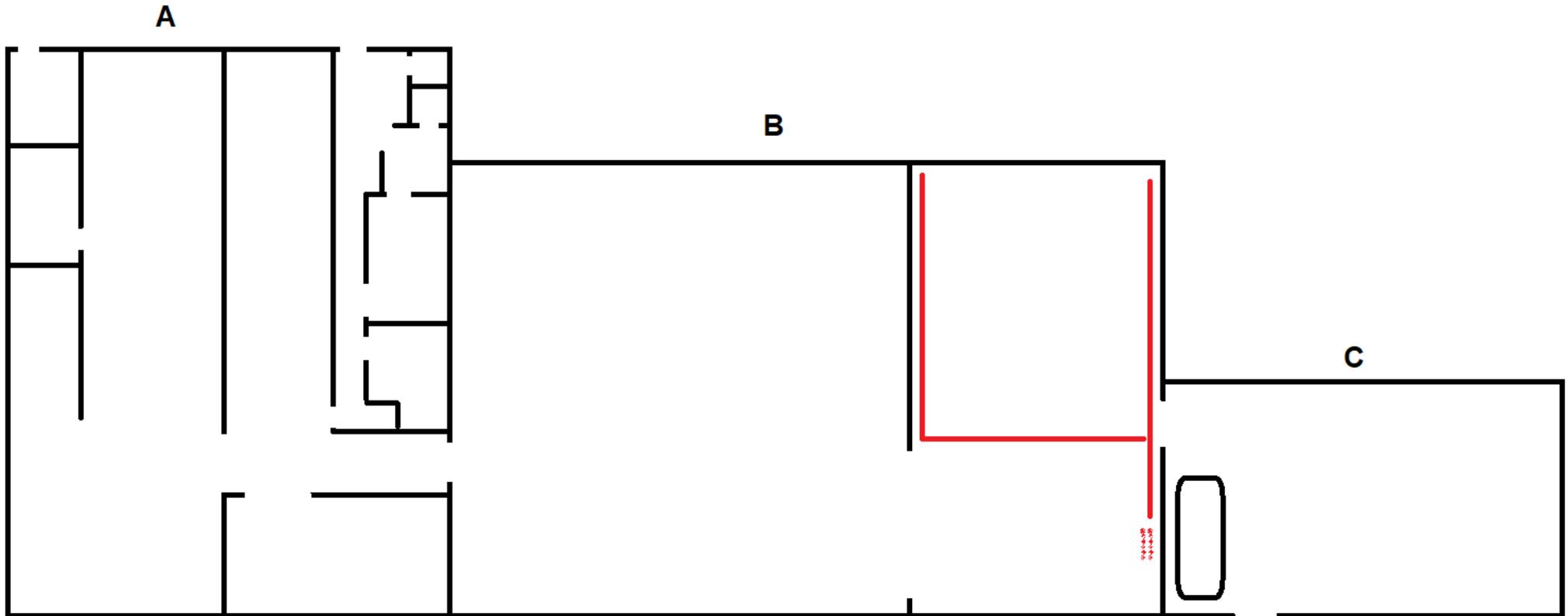
Regardless of the option chosen by the Contractor, this pay item will not be deleted, nor will the pay item BUILDING REMOVAL NO. 3 be deleted.

APPENDIX A

BUILDING REMOVAL - CASE I(FRIABLE AND NON-FRIABLE ASBESTOS
ABATEMENT)

BUILDING NO. 3

SR0135 Sidener Building, 709 Barrett Street, Springfield, IL

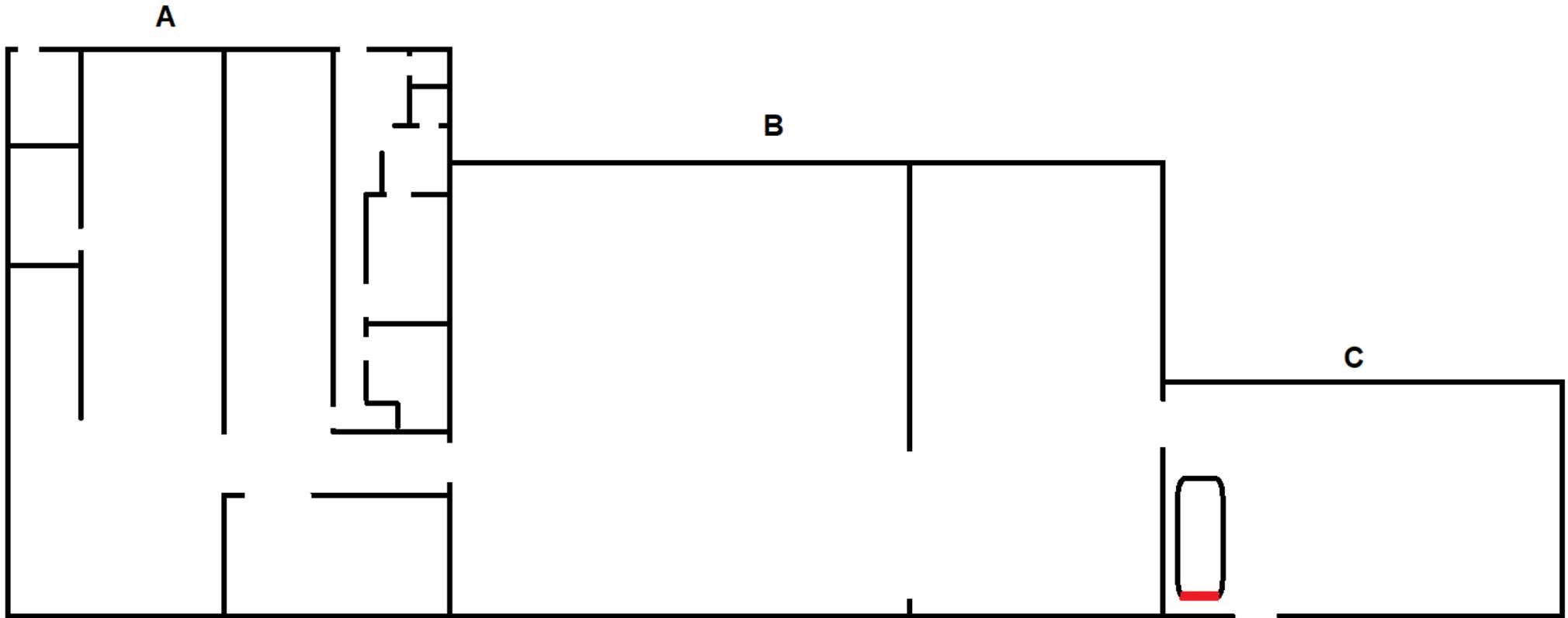


 HA TPA - Aircell Pipe Insulation

 HA TPA - Aircell Pipe Insulation Debris

← North

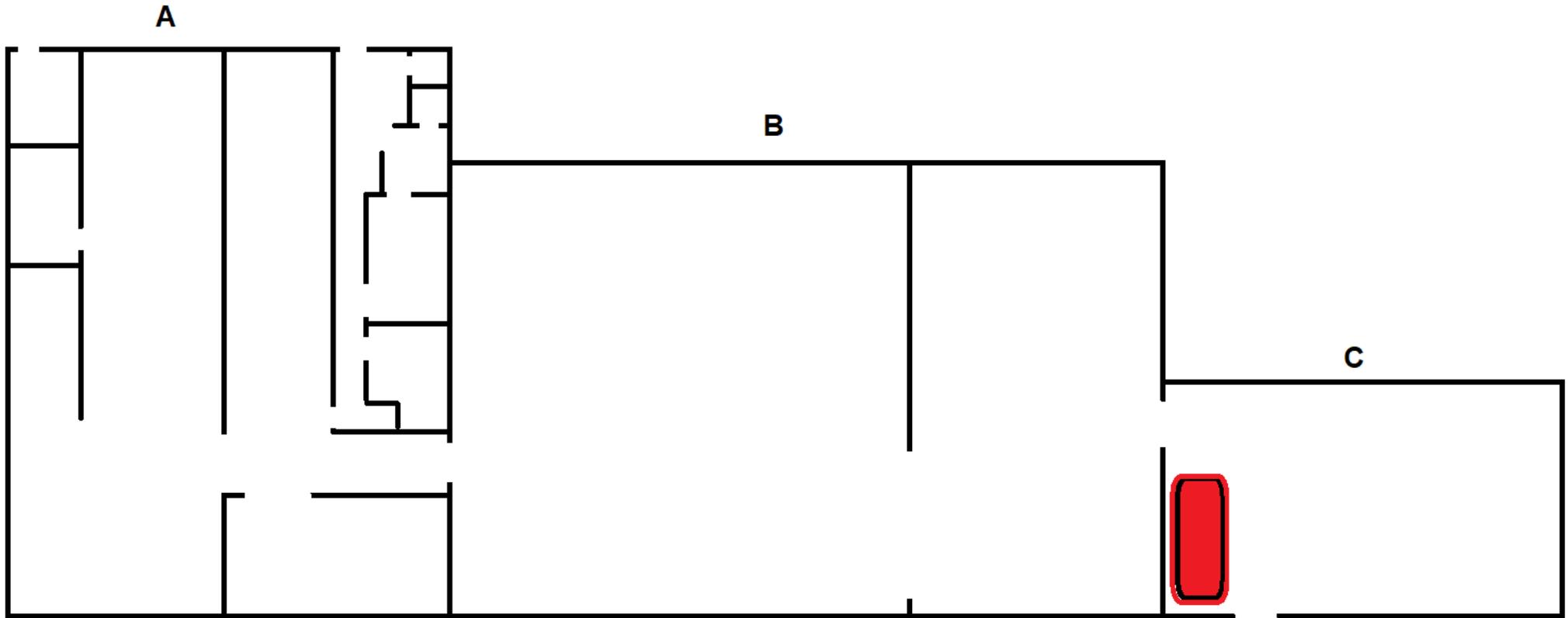
SR0135 Sidener Building, 709 Barrett Street, Springfield, IL



← North

 HA TTA - Boiler Door Insulation

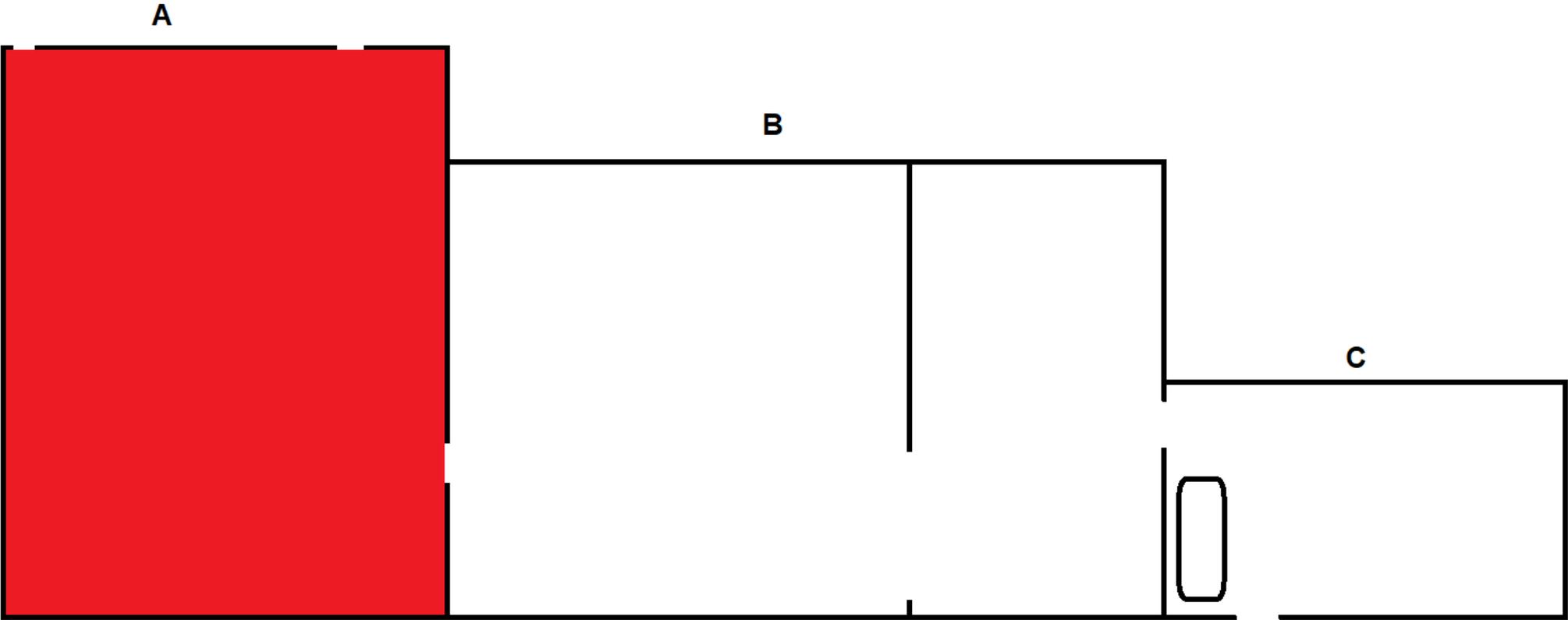
SR0135 Sidener Building, 709 Barrett Street, Springfield, IL



← North

 HA TTB - Insulation at Base of Boiler

SR0135 Sidener Building, 709 Barrett Street, Springfield, IL



HA MRA - Built Up Roofing Building A (Under Rubber)

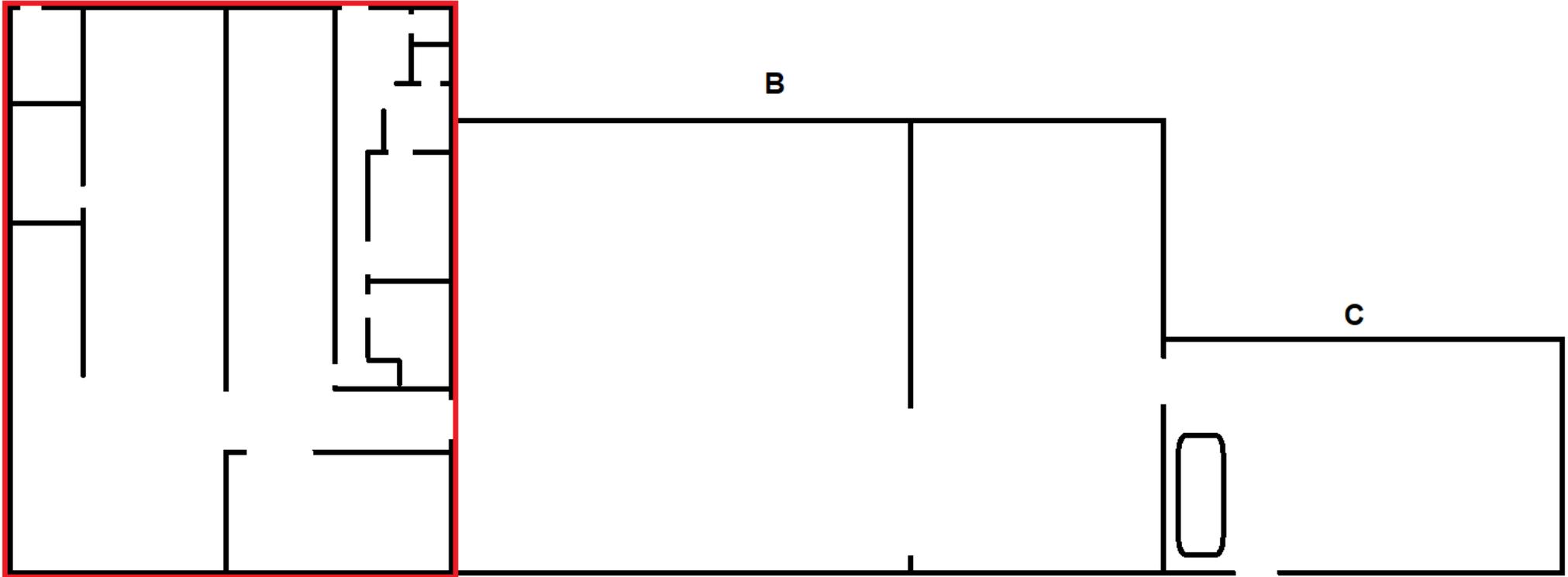
← North

SR0135 Sidener Building, 709 Barrett Street, Springfield, IL

A

B

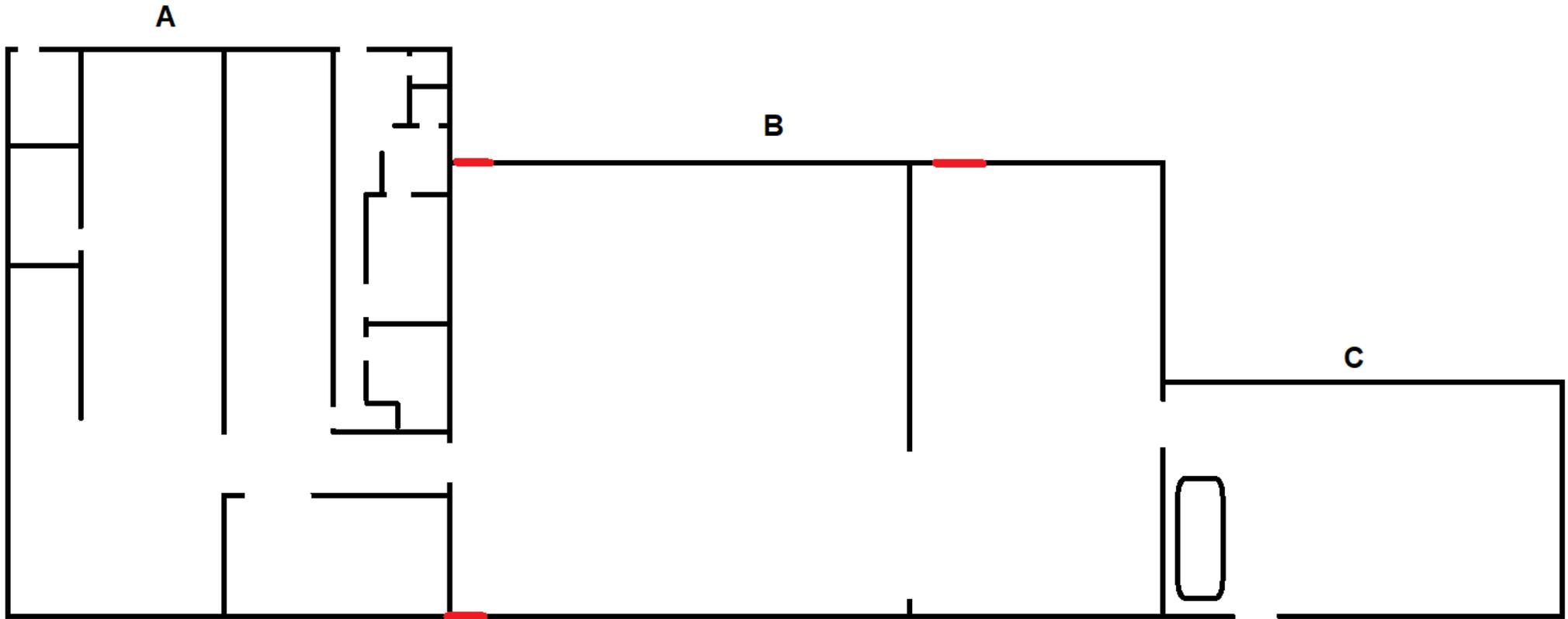
C



HA MRB - Roof Flashing Building A

North

SR0135 Sidener Building, 709 Barrett Street, Springfield, IL



 HA MMI - Tar Sealant on Corrugated Siding B Building

← North

APPENDIX B

MATERIAL DESCRIPTION TABLE

Material Description	% and Type of Asbestos	Location, Description, Sample Number (If Applicable)
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I. BUILDING REMOVAL - CASE I (NON-FRIABLE AND FRIABLE ASBESTOS ABATEMENT)

A. Building No. 3	Parcel No. SR0135	709 BARRETT ST
Aircel Pipe Insulation	80% chrysotile	Pipe insulation in east half of south metal-roof building. Friable. Sample TPA/1.
Boiler Door Insulation	15% chrysotile	Boiler door insulation in northwest corner of southernmost building. Friable. Samples TTA/1, TTA/2, TTA/3.
Boiler Base Insulation	20% chrysotile	Insulation around base of boiler in northwest corner of southernmost building. Friable. Samples TTB/1, TTB/2, TTB/3.
Roofing A	5% chrysotile	Under rubber of built-up roofing on northern flat-roof buildings. Category I Non-friable. Sample MRA/1.
Flashing A	7% chrysotile	Flashing on roof of on northern flat-roof buildings. Category I Non-friable. Sample MRB/1
Sealant B	7% chrysotile	Tar sealant of corrugated siding of metal-roof buildings. Category I Non-friable. Sample MMI/1

APPENDIX C

MATERIAL QUANTITIES TABLE

The following are approximate quantities of ACM to be removed from the building indicated. These material quantities do not indicate the cleaning required to remove asbestos debris and resulting contamination from the work areas.

I. BUILDING REMOVAL - CASE I (NON-FRIABLE AND FRIABLE ASBESTOS ABATEMENT)

A. Building No. 3	Parcel No. SR0135			709 BARRETT ST
<u>Material</u>	<u>Floor</u>	<u>Quantity Present</u>		<u>Friable</u>
Aircel Pipe Insulation		175	L.F.	Yes
Boiler Door Insulation		25	S.F.	Yes
Boiler Base Insulation		160	S.F.	Yes
Roofing A		8000	S.F.	No
Flashing A		720	S.F.	No
Sealant B		3	S.F.	No

BUILDING REMOVAL - CASE II (NON-FRIABLE ASBESTOS ABATEMENT) (BDE)

Effective: September 1, 1990

Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 4 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

<u>Bldg. No.</u>	<u>Parcel No.</u>	<u>Location</u>	<u>Description</u>
1	SR0134	1001 & 1003 E EDWARDS ST	One-story metal and wood framed commercial building with concrete block and brick exterior, low-pitch EDPM roof on wood and steel framing, and concrete floor/foundation.
4	SR0136	929 E SOUTH GRAND AVE	On-story brick office building with gabled shingle roof, and concrete floor/foundation.
6	SR0137	1311 S 11TH ST	Concrete block storage garage with concrete and dirt floor, concrete block foundation, and metal roof.
9	SR0137	1021 E SOUTH GRAND AVE	One-story masonry and frame office building with concrete floor, concrete and block foundation, and low-pitch wood deck built-up roofing.

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

The Contractor has the option of removing the non-friable asbestos prior to demolition or demolishing the building(s) with the non-friable asbestos in place. Refer to the Special Provisions titled "Asbestos Abatement (General Conditions)" and "Removal and Disposal of Non-Friable Asbestos Building No. 1, 4, 6, 9" contained herein.

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition and disposal assuming all non-friable asbestos is removed prior to demolition. Any salvage value shall be reflected in the contract unit price for this item.

EXPLANATION OF BIDDING TERMS: Two separate contract unit price items have been established for the removal of each building. They are:

1. BUILDING REMOVAL NO. 1, 4, 6, 9
2. REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1, 4, 6, 9

The Contractor shall have two options available for the removal and disposal of the non-friable asbestos.

The pay item for removal and disposal of non-friable asbestos will not be deleted regardless of the option chosen by the Contractor.

ASBESTOS ABATEMENT (GENERAL CONDITIONS): This work consists of the removal and disposal of non-friable asbestos from the building(s) to be demolished. All work shall be done according to the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), the Special Provision for "Removal and Disposal of Non-Friable Asbestos, Building No. 1, 4, 6, 9," and as outlined herein.

Sketches indicating the location of Asbestos Containing Material (ACM) are included in the proposal on pages ____ thru _____. Also refer to the Materials Description Table on page _____ for a brief description and location of the various materials. Also included is a Materials Quantities Table on page _____. This table states the ACM is non-friable and gives the approximate quantity. The quantities are given only for information and it shall be the Contractor's responsibility to determine the exact quantities prior to submitting his/her bid.

The work involved in the removal and disposal of non-friable asbestos if done prior to demolition, shall be performed by a Contractor or Sub-Contractor prequalified with the Illinois Capital Development Board.

The Contractor shall provide a shipping manifest, similar to the one shown on page _____, to the Engineer for the disposal of all ACM wastes.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work shall be the responsibility of the Contractor. Copies of the permit(s) shall be sent to the district office and the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any asbestos removal or demolition activity. Separate notices shall be sent for the asbestos removal work and the building demolition if they are done as separate operations.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217) 785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

- A. All submittals and notices shall be made to the Engineer except where otherwise specified herein.
- B. Submittals that shall be made prior to start of work:
 1. Submittals required under Asbestos Abatement Experience.
 2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.
 3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.
 4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.
 5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).

6. Submit a list of penalties, including liquidated damages, incurred through non-compliance with asbestos abatement project specifications.
 7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.
 8. Submit proof of written notification and compliance with the "Notifications" paragraph.
- C. Submittals that shall be made upon completion of abatement work:
1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;
 2. Submit daily copies of work site entry logbooks with information on worker and visitor access;
 3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and
 4. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance:

- A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.
- B. The Contractor shall document current Workmen's Compensation Insurance coverage.
- C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience:

- A. Company Experience. Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.
- B. Personnel Experience:

1. For Superintendent, the Contractor shall supply:
 - a. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.
 - b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.
2. For workers involved in the removal of asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who will be working on this project.

ABATEMENT AIR MONITORING: The Contractor shall comply with the following:

- A. Personal Monitoring. All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted according to 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits shall be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.
- B. Interior Non-Friable Asbestos-Containing Materials. The Contractor shall perform personal air monitoring during removal of all non-friable Transite and floor tile removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.
- C. Exterior Non-Friable Asbestos-Containing Materials. The Contractor shall perform personal air monitoring during removal of all non-friable cementitious panels, piping, roofing felts, and built up roofing materials that contain asbestos.

The Contractor shall conduct down wind area sampling to monitor airborne fiber levels at a frequency of no less than three per day.

D. Air Monitoring Professional

1. All air sampling shall be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional shall submit

documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".

2. Air sampling shall be conducted according to NIOSH Method 7400. The results of these tests shall be provided to the Engineer within 24 hours of the collection of air samples.

REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1, 4, 6, 9: The Contractor has the option of removing and disposing of the non-friable asbestos prior to demolition of the building(s) or demolishing the building(s) with the non-friable asbestos in place.

Option #1 - If the Contractor chooses to remove all non-friable asbestos prior to demolition, the work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)".

Option #2 - If the Contractor chooses to demolish the building(s) with the non-friable asbestos in place, the following provisions shall apply:

1. Continuously wet all non-friable ACM and other building debris with water during demolition.
2. Dispose of all demolition debris as asbestos containing material by placing it in lined, covered transport haulers and placing it in an approved landfill.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF NON-FRIABLE ASBESTOS, BUILDING NO. 1, 4, 6, 9, as shown.

The cost for this work shall be determined as follows:

Option #1 - Actual cost of removal and disposal of non-friable asbestos.

Option #2 - The difference in cost between removing and disposing of the building if all non-friable asbestos is left in place and removing and disposing of the building assuming all non-friable asbestos is removed prior to demolition.

The cost of removing and disposing of the building(s), assuming all non-friable asbestos is removed first, shall be represented by the pay item "BUILDING REMOVAL NO. ".

Regardless of the option chosen by the Contractor, this pay item will not be deleted, nor will the pay item BUILDING REMOVAL NO. 1, 4, 6, 9 be deleted.

5048I

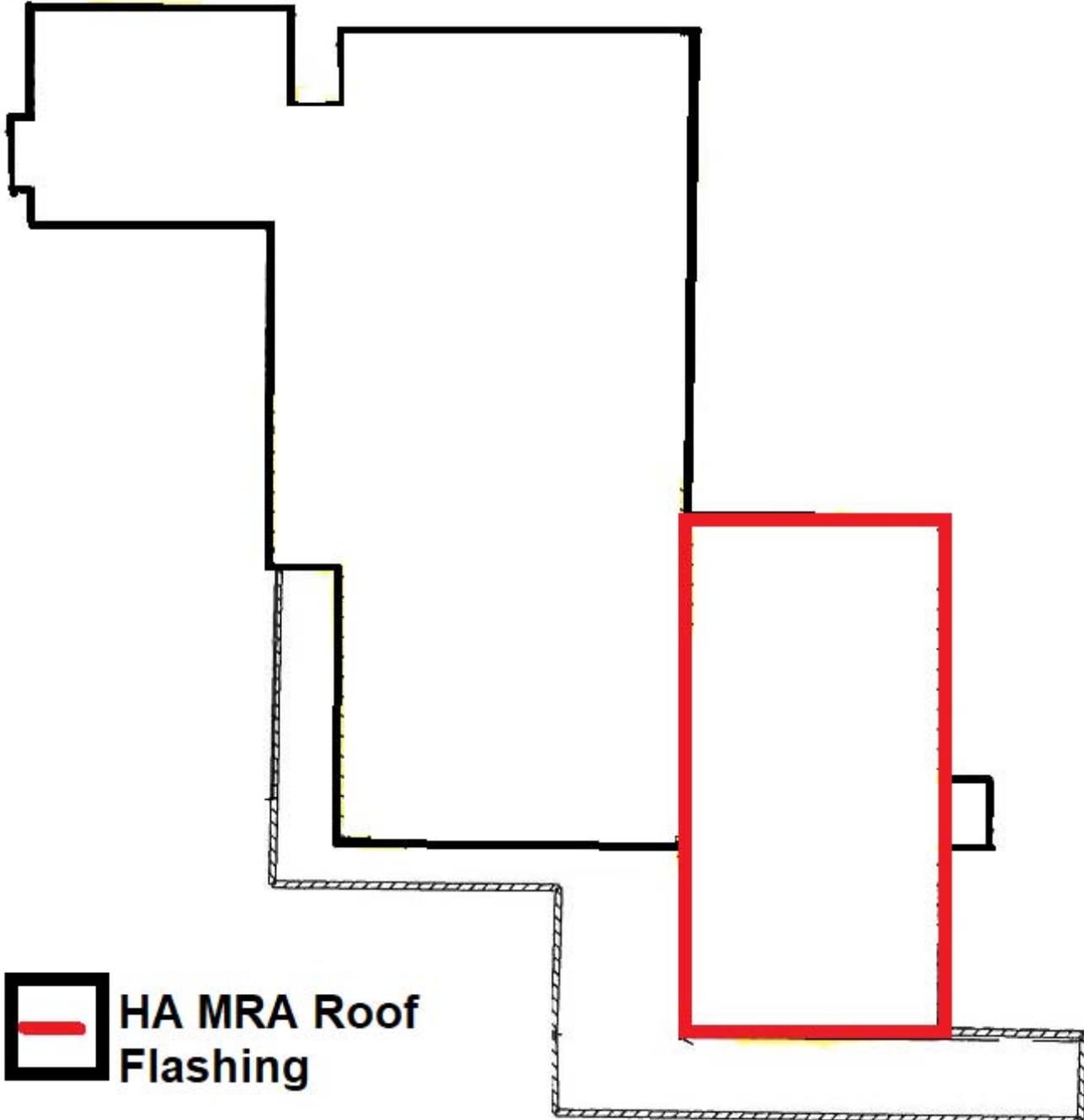
APPENDIX A

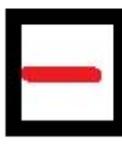
BUILDING REMOVAL - CASE II
(NON-FRIABLE ASBESTOS ABATEMENT)

BUILDING NO. 1

SR0134 Kwik Wall

North Bldg., 1001 E. Edwards St.,
Springfield, IL



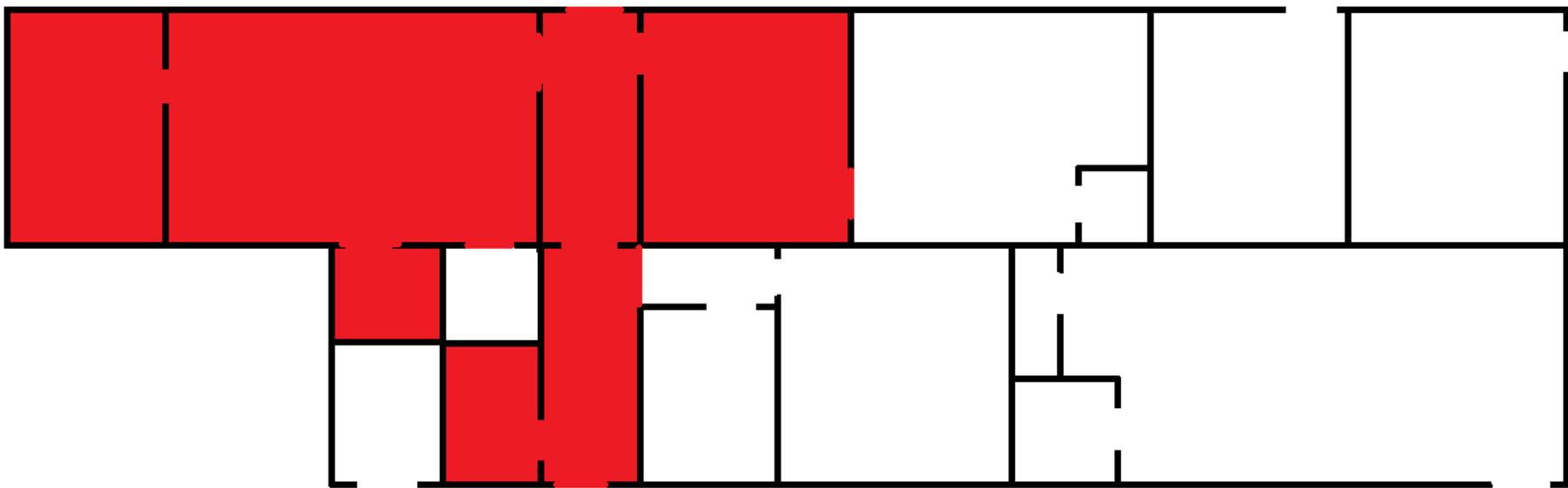
 HA MRA Roof
Flashing

Central Bldg., 1003 E. Edwards St.,
Springfield, IL

 North

BUILDING NO. 4

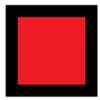
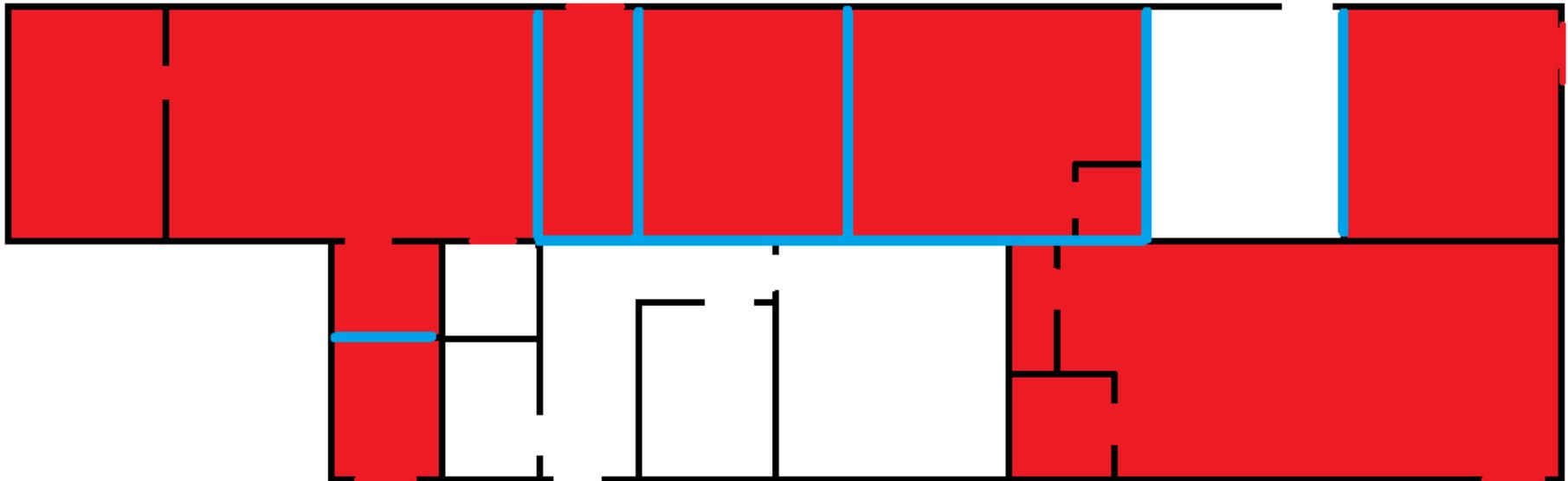
SR0136 : Norfolk Southern Building, 929 E. South Grand Avenue, Springfield, IL



 HA MFC - 9"x9" Floor Tile (Under Carpet and 12"x12" Non-ACM Floor Tile)

 North

SR0136 : Norfolk Southern Building, 929 E. South Grand Avenue, Springfield, IL



HA MTA - Transite Ceiling Panels (Majority is above 2'x4' Lay In Ceiling Tile)



HA MTA - Transite Wall Panels (Behind Paneling)

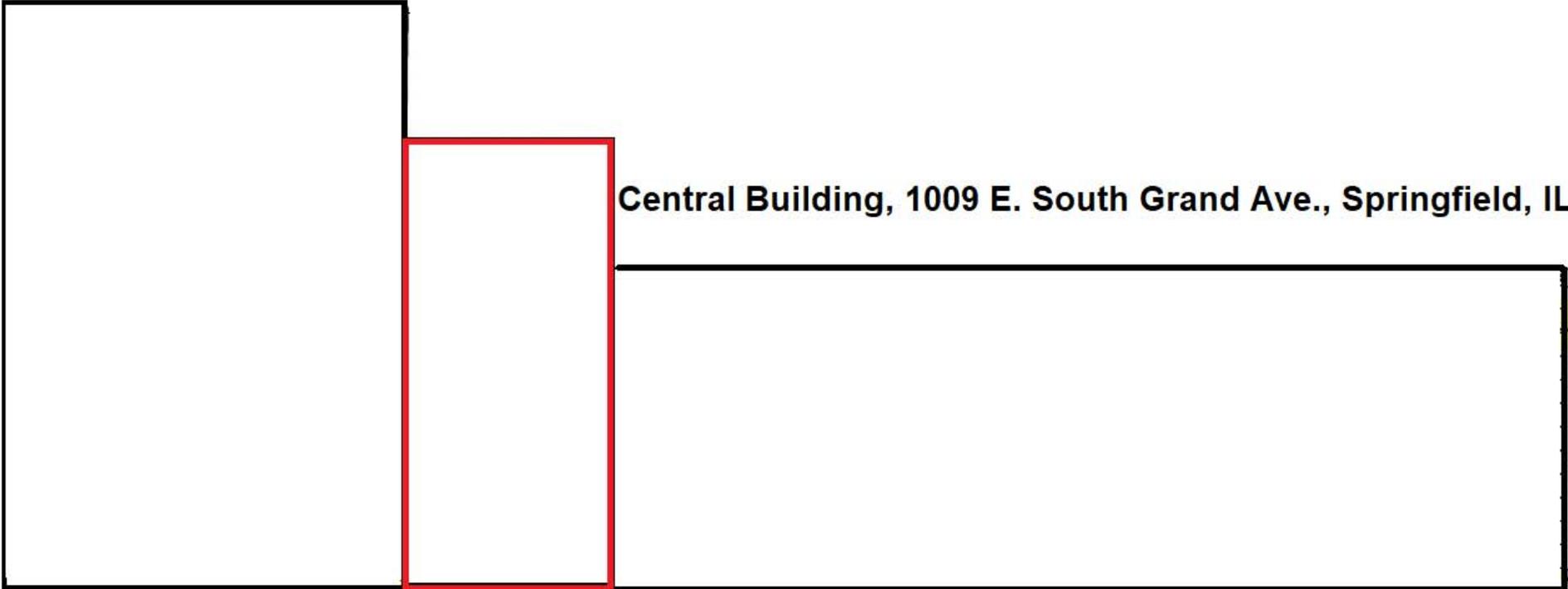


North

BUILDING NO. 6

SR0137: Masonry Consortium

North Building, 1311 S. 11th Ave., Springfield, IL



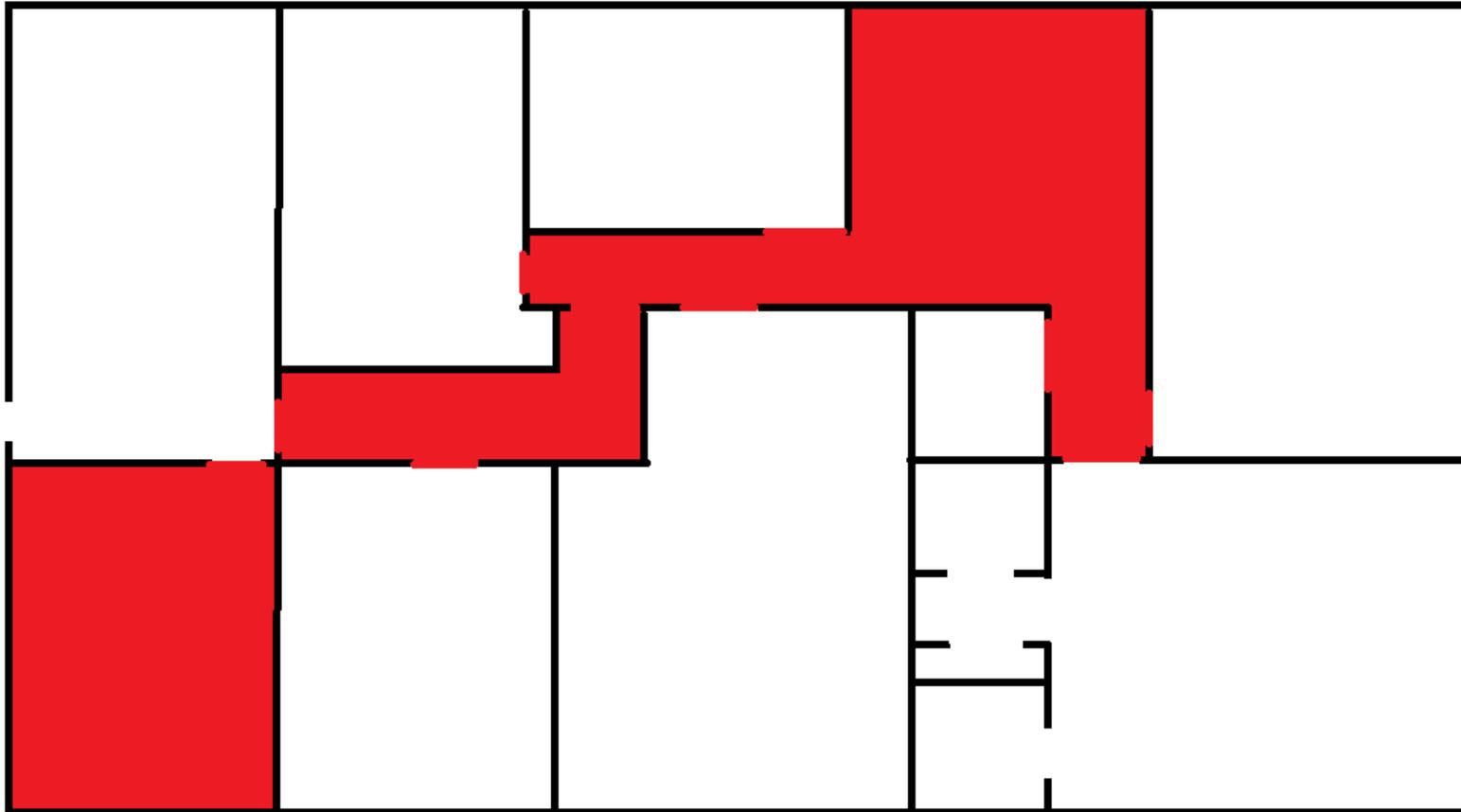
Central Building, 1009 E. South Grand Ave., Springfield, IL

 HA MRA - Flashing on Roof

 North

BUILDING NO. 9

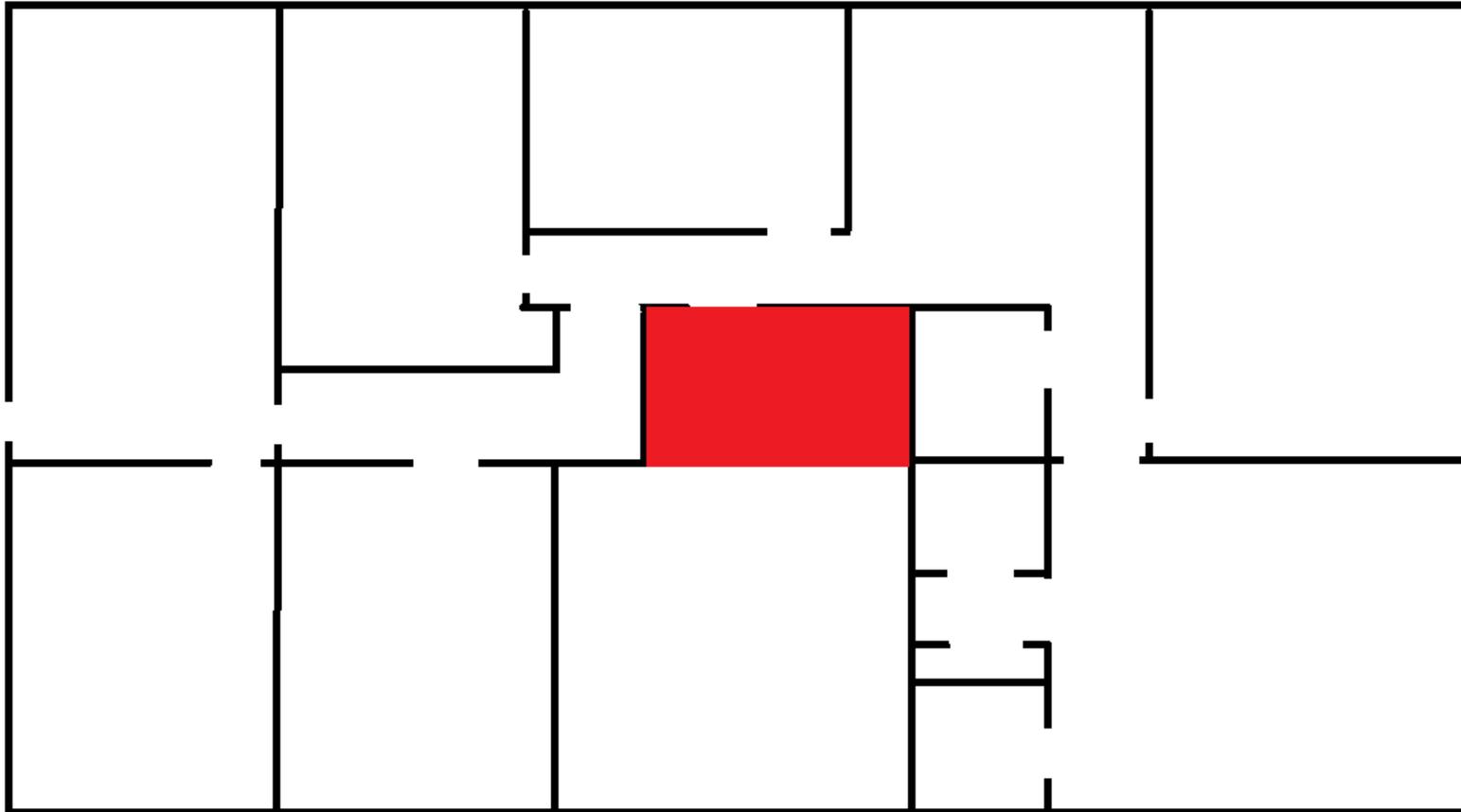
SR0137 Masonry Consortium South Building
1021 E. South Grand Avenue, Springfield, IL



HA MFB & MMB 12"x12" Floor Tile & Black Mastic

← North

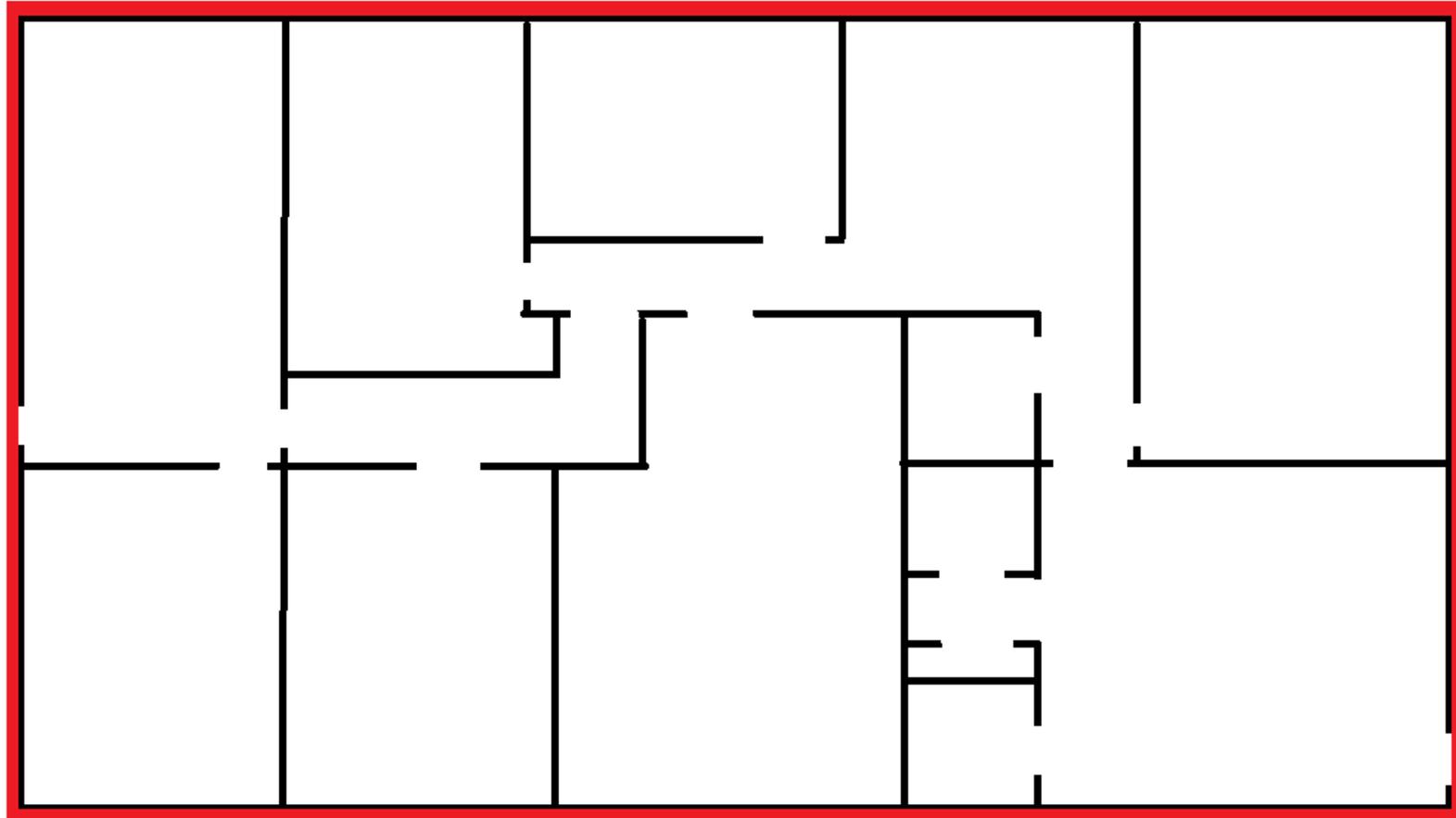
SR0137 Masonry Consortium South Building
1021 E. South Grand Avenue, Springfield, IL



 HA MTA - Transite Panels

 North

SR0137 Masonry Consortium South Building
1021 E. South Grand Avenue, Springfield, IL



← North

 HA MRA Roof Flashing

APPENDIX B

MATERIAL DESCRIPTION TABLE

Material Description	% and Type of Asbestos	Location, Description, Sample Number (If Applicable)
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I. BUILDING REMOVAL - CASE II (NON-FRIABLE ASBESTOS ABATEMENT)

A. Building No. 1	Parcel No. SR0134	1001 & 1003 E EDWARDS ST
Roof Flashing Coating	4%-5% chrysotile	Roof flashing coating on southwest section of building. Category I Non-friable. Samples MRA/1, MRA/2, MRA/3
B. Building No. 4	Parcel No. SR0136	929 E SOUTH GRAND AVE
9"x9" Floor Tile	2% chrysotile	Floor tile under carpet in northern portion of building. Category I Non-friable. Samples MFC/1, MFC/2, MFC/3
Transite Panels	20% chrysotile	Transite panels behind wall paneling and on ceiling (majority above 2'x4' lay in ceiling tile). Category II Non-friable. Sample MTA/1
C. Building No. 6	Parcel No. SR0137	1311 S 11TH ST
Roof Flashing	4%-5% chrysotile	Roof flashing. Category I Non-friable. Samples MRA/1, MRA/2, MRA/3
D. Building No. 9	Parcel No. SR0137	1021 E SOUTH GRAND AVE
12"x12" Floor Tile	2% chrysotile	12"x12" floor tile. Category I Non-friable. Samples MFB/1, MFB/2, MFB/3
Mastic for Floor Tile	3%-5% chrysotile	Black mastic under 12"x12" floor tile. Category I Non-friable. Samples MMB/1, MMB/2, MMB/3
Transite Panels	20% chrysotile	Transite Panels in central portion of building. Category II Non-friable. Sample MTA/1
Roof Flashing	2%-3% chrysotile	Roof flashing. Category I Non-friable. Samples MRA/1, MRA/2, MRA/3

APPENDIX C

MATERIAL QUANTITIES TABLE

The following are approximate quantities of ACM to be removed from the building indicated. These material quantities do not indicate the cleaning required to remove asbestos debris and resulting contamination from the work areas.

I. BUILDING REMOVAL - CASE II (NON-FRIABLE ASBESTOS ABATEMENT)

A. Building No. 1	Parcel No. SR0134	1001 & 1003 E EDWARDS ST
<u>Material</u>	<u>Floor</u>	<u>Friable</u>
Roof Flashing Coating	480 S.F.	No
B. Building No. 4	Parcel No. SR0136	929 E SOUTH GRAND AVE
<u>Material</u>	<u>Floor</u>	<u>Friable</u>
9"x9" Floor Tile	1000 S.F.	No
Transite Panels	4500 S.F.	No (Removal Required)
C. Building No. 6	Parcel No. SR0137	1311 S 11TH ST
<u>Material</u>	<u>Floor</u>	<u>Friable</u>
Roof Flashing	300 S.F.	No
D. Building No. 9	Parcel No. SR0137	1021 E SOUTH GRAND AVE
<u>Material</u>	<u>Floor</u>	<u>Friable</u>
12"x12" Floor Tile	300 S.F.	No
Mastic for Floor Tile	300 S.F.	No
Transite Panels	100 S.F.	No (Removal Required)
Roof Flashing	400 S.F.	No

BUILDING REMOVAL - CASE III (FRIABLE ASBESTOS ABATEMENT) (BDE)

Effective: September 1, 1990

Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 1 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

<u>Bldg. No.</u>	<u>Parcel No.</u>	<u>Location</u>	<u>Description</u>
2	SR0134	1010 E EDWARDS ST	One-story steel and wood framed commercial building with brick and painted steel siding, low-pitch EDPM roof, and concrete floor/foundation. The building includes two large mezzanine storage areas, a pit for a hydraulic jack rack system and structural support for several cranes.

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

All friable asbestos shall be removed from the building(s) prior to demolition. Refer to the Special Provisions titled "Asbestos Abatement (General Conditions)" and "Removal and Disposal of Friable Asbestos Building No. 2" contained herein.

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein. The lump sum unit price(s) for this work shall represent the cost of demolition and disposal assuming all friable asbestos has been removed prior to demolition. Any salvage value shall be reflected in the contract unit price for this item.

EXPLANATION OF BIDDING TERMS: Two separate contract unit price items have been established for the removal of each building. They are:

1. BUILDING REMOVAL NO. 2
2. REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 2

ASBESTOS ABATEMENT (GENERAL CONDITIONS): This work consists of the removal and disposal of friable asbestos from the building(s) to be demolished. All work shall be done according to the requirements of the U.S. Environmental Protection Agency (USEPA), the Illinois Environmental Protection Agency (IEPA), the Occupational Safety and Health Administration (OSHA), the Special Provision for "Removal and Disposal of Friable Asbestos, Building No. 2" and as outlined herein.

Sketches indicating the location of Asbestos Containing Material (ACM) are included in the proposal on pages _____ thru _____. Also refer to the Materials Description Table on page _____ for a brief description and location of the various materials. Also included is a Materials Quantities Table on page _____. This table states the ACM is friable and gives the approximate quantity. The quantities are given only for information and it shall be the Contractor's responsibility to determine the exact quantities prior to submitting his/her bid.

The work involved in the removal and disposal of friable asbestos shall be performed by a Contractor or Sub-Contractor prequalified with the Illinois Capital Development Board.

The Contractor shall provide a shipping manifest, similar to the one shown on page _____, to the Engineer for the disposal of all ACM wastes.

Permits: The Contractor shall apply for permit(s) in compliance with applicable regulations of the Illinois Environmental Protection Agency. Any and all other permits required by other federal, state, or local agencies for carrying on the work shall be the responsibility of the Contractor. Copies of these permits shall be sent to the district office and the Engineer.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any asbestos removal or demolition activity. Separate notices shall be sent for the asbestos removal work and the building demolition.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

- A. All submittals and notices shall be made to the Engineer except where otherwise specified herein.
- B. Submittals that shall be made prior to start of work:
 - 1. Submittals required under Asbestos Abatement Experience.
 - 2. Submit documentation indicating that all employees have had medical examinations and instruction on the hazards of asbestos exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures as specified in Worker Protection Procedures.
 - 3. Submit manufacturer's certification stating that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to ANSI 29.2.
 - 4. Submit to the Engineer the brand name, manufacturer, and specification of all sealants or surfactants to be used. Testing under existing conditions will be required at the direction of the Engineer.
 - 5. Submit proof that all required permits, site locations, and arrangements for transport and disposal of asbestos-containing or asbestos-contaminated materials, supplies, and the like have been obtained (i.e., a letter of authorization to utilize designated landfill).
 - 6. Submit a list of penalties, including liquidated damages, incurred through non-compliance with asbestos abatement project specifications.
 - 7. Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination units, the sequencing of work, the respiratory protection plan to be

used during this work, a site safety plan, a disposal plan including the location of an approved disposal site, and a detailed description of the methods to be used to control pollution. The plan shall be submitted to the Engineer prior to the start of work.

8. Submit proof of written notification and compliance with the "Notifications" paragraph.

C. Submittals that shall be made upon completion of abatement work:

1. Submit copies of all waste chain-of-custodies, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area;
2. Submit daily copies of work site entry logbooks with information on worker and visitor access;
3. Submit logs documenting filter changes on respirators, HEPA vacuums, negative pressure ventilation units, and other engineering controls; and
4. Submit results of any bulk material analysis and air sampling data collected during the course of the abatement including results of any on-site testing by any federal, state, or local agency.

Certificate of Insurance:

- A. The Contractor shall document general liability insurance for personal injury, occupational disease and sickness or death, and property damage.
- B. The Contractor shall document current Workmen's Compensation Insurance coverage.
- C. The Contractor shall supply insurance certificates as specified by the Department.

Asbestos Abatement Experience:

- A. Company Experience: Prior to starting work, the Contractor shall supply evidence that he/she has been prequalified with the Illinois Capital Development Board and that he/she has been included on the Illinois Department of Public Health's list of approved Contractors.
- B. Personnel Experience:
 1. For Superintendent, the Contractor shall supply:
 - a. Evidence of knowledge of applicable regulations in safety and environmental protection is required as well as training in asbestos abatement as evidenced by the successful completion of a training course in supervision of asbestos abatement as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model

Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to the Engineer prior to the start of work.

- b. Documentation of experience with abatement work in a supervisory position as evidenced through supervising at least two asbestos abatement projects; provide names, contact, phone number, and locations of two projects in which the individual(s) has worked in a supervisory capacity.
2. For workers involved in the removal of asbestos, the Contractor shall provide training as evidenced by the participation and successful completion of an accredited training course for asbestos abatement workers as specified in 40 CFR 763, Subpart E, Appendix C, EPA Model Contractor Accreditation Plan. A copy of the certificate of successful completion shall be provided to all employees who will be working on this project.

ABATEMENT AIR MONITORING: The Contractor shall comply with the following:

- A. Personal Monitoring: All personal monitoring shall be conducted per specifications listed in OSHA regulation, Title 29, Code of Federal Regulation 1926.58. All area sampling shall be conducted according to 40 CFR Part 763.90. All air monitoring equipment shall be calibrated and maintained in proper operating condition. Excursion limits will be monitored daily. Personal monitoring is the responsibility of the Contractor. Additional personal samples may be required by the Engineer at any time during the project.
- B. Contained Work Areas for Removal of Friable Asbestos: Area samples shall be collected for the department within the work area daily. A minimum of one sample shall be taken outside of the abatement area removal operations. The Engineer will also have the option to require additional personal samples and/or clearance samples during this type of work.
- C. Air Monitoring Professional
 1. All air sampling will be conducted by a qualified Air Sampling Professional supplied by the Contractor. The Air Sampling Professional shall submit documentation of successful completion of the National Institute for Occupational Safety and Health (NIOSH) course #582 - "Sampling and Evaluating Airborne Asbestos Dust".
 2. Air sampling will be conducted according to NIOSH Method 7400. The results of these tests shall be provided to the Engineer within 24 hours of the collection of air samples.

REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 2 : This work consists of the removal and disposal of all friable asbestos from the building(s) prior to demolition. The work shall be done according to the Special Provision titled "Asbestos Abatement (General Conditions)" and as outlined herein.

This work will be paid for at the contract unit price per lump sum for REMOVAL AND DISPOSAL OF FRIABLE ASBESTOS, BUILDING NO. 2, as shown.

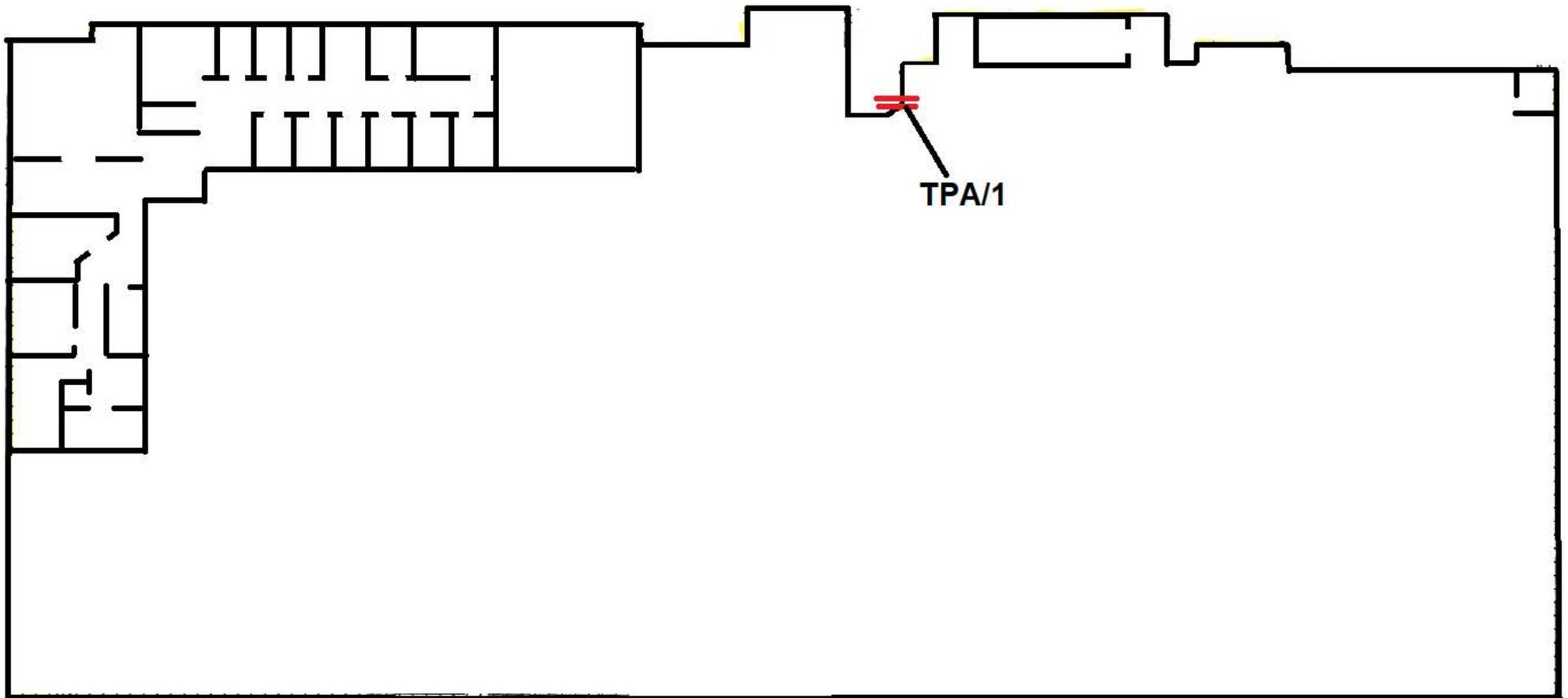
5049I

APPENDIX A

BUILDING REMOVAL - CASE III
(FRIABLE ASBESTOS ABATEMENT)

BUILDING NO. 2

SR0134 Kwik Wall South Building, 1010 E. Edwards Street, Springfield, IL



TPA/1

 HA TPA - Aircell Pipe Insulation

 North

APPENDIX B

MATERIAL DESCRIPTION TABLE

Material Description	% and Type of Asbestos	Location, Description, Sample Number (If Applicable)
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I. BUILDING REMOVAL - CASE III (FRIABLE ASBESTOS ABATEMENT)

A. Building No. 2	Parcel No. SR0134	1010 E EDWARDS ST
Aircel Pipe Insulation	60% chrysotile	Pipe insulation in nook on east side of building, north of loading dock area. Friable. Sample TPA/1

APPENDIX C

MATERIAL QUANTITIES TABLE

The following are approximate quantities of ACM to be removed from the building indicated. These material quantities do not indicate the cleaning required to remove asbestos debris and resulting contamination from the work areas.

I. BUILDING REMOVAL - CASE III (FRIABLE ASBESTOS ABATEMENT)

A. Building No. 2	Parcel No. SR0134	1010 E EDWARDS ST
<u>Material</u>	<u>Floor</u>	<u>Friable</u>
Aircel Pipe Insulation	40 L.F.	Yes

BUILDING REMOVAL - CASE IV (NO ASBESTOS) (BDE)

Effective: September 1, 1990

Revised: April 1, 2010

BUILDING REMOVAL: This work shall consist of the removal and disposal of 3 building(s), together with all foundations, retaining walls, and piers, down to a plane 1 ft (300 mm) below the ultimate or existing grade in the area and also all incidental and collateral work necessary to complete the removal of the building(s) in a manner approved by the Engineer. Any holes, such as basements, shall be filled with a suitable granular material. The building(s) are identified as follows:

<u>Bldg. No.</u>	<u>Parcel No.</u>	<u>Location</u>	<u>Description</u>
5	SR0137	1311 S 11TH ST	Concrete block warehouse with concrete floor, concrete and concrete block foundation, and metal roof.
7	SR0137	1311 S 11TH ST	Four-bay concrete block warehouse with dirt floor and metal roof, and open-sided block storage shed with dirt floor and steel frame metal roof.
8	SR0137A	1311 S 11TH ST	Cell tower

Discontinuance of Utilities: The Contractor shall arrange for the discontinuance of all utility services and the removal of the metering devices that serve the building(s) according to the respective requirements and regulations of the City, County, or utility companies involved. The Contractor shall disconnect and seal, in an approved manner, all service outlets that serve any building(s) he/she is to remove.

Signs: Immediately upon execution of the contract and prior to the wrecking of any structures, the Contractor shall be required to paint or stencil, in contrasting colors of an oil base paint, on all four sides of each residence and two opposite sides of other structures, the following sign:

PROPERTY ACQUIRED FOR
HIGHWAY CONSTRUCTION
TO BE DEMOLISHED BY THE

VANDALS WILL BE PROSECUTED

The signs shall be positioned in a prominent location on the structure so that they can be easily seen and read and at a sufficient height to prevent defacing. The Contractor shall not paint signs nor start demolition of any building(s) prior to the time that the State becomes the owner of the respective building(s).

Basis of Payment: This work will be paid for at the contract lump sum unit price for BUILDING REMOVAL, numbers as listed above, which price shall be payment in full for complete removal of the buildings and structures, including any necessary backfilling material as specified herein.

The lump sum unit price(s) for this work shall represent the cost of demolition. Any salvage value shall be reflected in the contract unit price for this item.

Notifications: The "Demolition/Renovation Notice" form, which can be obtained from the IEPA office, shall be completed and submitted to the address listed below at least ten days prior to commencement of any demolition activity.

Asbestos Demolition/Renovation Coordinator
Illinois Environmental Protection Agency
Division of Air Pollution Control
P. O. Box 19276
Springfield, Illinois 62794-9276
(217)785-1743

Notices shall be updated if there is a change in the starting date or the amount of asbestos changes by more than 20 percent.

Submittals:

- A. All submittals and notices shall be made to the Engineer except where otherwise specified herein.
- B. Prior to starting work, the Contractor shall submit proof of written notification and compliance with the "Notifications" paragraph.

5053I

COMPENSABLE DELAY COSTS (BDE)

Effective: June 2, 2017

Revised: April 1, 2019

Revise Article 107.40(b) of the Standard Specifications to read:

“(b) Compensation. Compensation will not be allowed for delays, inconveniences, or damages sustained by the Contractor from conflicts with facilities not meeting the above definition; or if a conflict with a utility in an unanticipated location does not cause a shutdown of the work or a documentable reduction in the rate of progress exceeding the limits set herein. The provisions of Article 104.03 notwithstanding, compensation for delays caused by a utility in an unanticipated location will be paid according to the provisions of this Article governing minor and major delays or reduced rate of production which are defined as follows.

- (1) Minor Delay. A minor delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two hours, but not to exceed two weeks.
- (2) Major Delay. A major delay occurs when the work in conflict with the utility in an unanticipated location is completely stopped for more than two weeks.
- (3) Reduced Rate of Production Delay. A reduced rate of production delay occurs when the rate of production on the work in conflict with the utility in an unanticipated location decreases by more than 25 percent and lasts longer than seven calendar days.”

Revise Article 107.40(c) of the Standard Specifications to read:

“(c) Payment. Payment for Minor, Major, and Reduced Rate of Production Delays will be made as follows.

- (1) Minor Delay. Labor idled which cannot be used on other work will be paid for according to Article 109.04(b)(1) and (2) for the time between start of the delay and the minimum remaining hours in the work shift required by the prevailing practice in the area.

Equipment idled which cannot be used on other work, and which is authorized to standby on the project site by the Engineer, will be paid for according to Article 109.04(b)(4).

- (2) Major Delay. Labor will be the same as for a minor delay.

Equipment will be the same as for a minor delay, except Contractor-owned equipment will be limited to two weeks plus the cost of move-out to either the

Contractor's yard or another job and the cost to re-mobilize, whichever is less. Rental equipment may be paid for longer than two weeks provided the Contractor presents adequate support to the Department (including lease agreement) to show retaining equipment on the job is the most economical course to follow and in the public interest.

- (3) Reduced Rate of Production Delay. The Contractor will be compensated for the reduced productivity for labor and equipment time in excess of the 25 percent threshold for that portion of the delay in excess of seven calendar days. Determination of compensation will be in accordance with Article 104.02, except labor and material additives will not be permitted.

Payment for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be determined according to Article 109.13.”

Revise Article 108.04(b) of the Standard Specifications to read:

“(b) No working day will be charged under the following conditions.

- (1) When adverse weather prevents work on the controlling item.
- (2) When job conditions due to recent weather prevent work on the controlling item.
- (3) When conduct or lack of conduct by the Department or its consultants, representatives, officers, agents, or employees; delay by the Department in making the site available; or delay in furnishing any items required to be furnished to the Contractor by the Department prevents work on the controlling item.
- (4) When delays caused by utility or railroad adjustments prevent work on the controlling item.
- (5) When strikes, lock-outs, extraordinary delays in transportation, or inability to procure critical materials prevent work on the controlling item, as long as these delays are not due to any fault of the Contractor.
- (6) When any condition over which the Contractor has no control prevents work on the controlling item.”

Revise Article 109.09(f) of the Standard Specifications to read:

“(f) Basis of Payment. After resolution of a claim in favor of the Contractor, any adjustment in time required for the work will be made according to Section 108. Any adjustment in the costs to be paid will be made for direct labor, direct materials, direct equipment, direct jobsite overhead, direct offsite overhead, and other direct costs allowed by the resolution. Adjustments in costs will not be made for interest charges, loss of anticipated profit, undocumented loss of efficiency, home office overhead and unabsorbed overhead

other than as allowed by Article 109.13, lost opportunity, preparation of claim expenses and other consequential indirect costs regardless of method of calculation.

The above Basis of Payment is an essential element of the contract and the claim cost recovery of the Contractor shall be so limited.”

Add the following to Section 109 of the Standard Specifications.

“109.13 Payment for Contract Delay. Compensation for escalated material costs, escalated labor costs, extended project overhead, and extended traffic control will be allowed when such costs result from a delay meeting the criteria in the following table.

Contract Type	Cause of Delay	Length of Delay
Working Days	Article 108.04(b)(3) or Article 108.04(b)(4)	No working days have been charged for two consecutive weeks.
Completion Date	Article 108.08(b)(1) or Article 108.08(b)(7)	The Contractor has been granted a minimum two week extension of contract time, according to Article 108.08.

Payment for each of the various costs will be according to the following.

- (a) Escalated Material and/or Labor Costs. When the delay causes work, which would have otherwise been completed, to be done after material and/or labor costs have increased, such increases will be paid. Payment for escalated material costs will be limited to the increased costs substantiated by documentation furnished by the Contractor. Payment for escalated labor costs will be limited to those items in Article 109.04(b)(1) and (2), except the 35 percent and 10 percent additives will not be permitted.
- (b) Extended Project Overhead. For the duration of the delay, payment for extended project overhead will be paid as follows.
 - (1) Direct Jobsite and Offsite Overhead. Payment for documented direct jobsite overhead and documented direct offsite overhead, including onsite supervisory and administrative personnel, will be allowed according to the following table.

Original Contract Amount	Supervisory and Administrative Personnel
Up to \$5,000,000	One Project Superintendent
Over \$ 5,000,000 - up to \$25,000,000	One Project Manager, One Project Superintendent or Engineer, and One Clerk
Over \$25,000,000 - up to \$50,000,000	One Project Manager, One Project Superintendent, One Engineer, and

	One Clerk
Over \$50,000,000	One Project Manager, Two Project Superintendents, One Engineer, and One Clerk

(2) Home Office and Unabsorbed Overhead. Payment for home office and unabsorbed overhead will be calculated as 8 percent of the total delay cost.

(c) Extended Traffic Control. Traffic control required for an extended period of time due to the delay will be paid for according to Article 109.04.

When an extended traffic control adjustment is paid under this provision, an adjusted unit price as provided for in Article 701.20(a) for increase or decrease in the value of work by more than ten percent will not be paid.

Upon payment for a contract delay under this provision, the Contractor shall assign subrogation rights to the Department for the Department's efforts of recovery from any other party for monies paid by the Department as a result of any claim under this provision. The Contractor shall fully cooperate with the Department in its efforts to recover from another party any money paid to the Contractor for delay damages under this provision."

80384

DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION (DBE)

Effective: September 1, 2000

Revised: March 2, 2019

FEDERAL OBLIGATION. The Department of Transportation, as a recipient of federal financial assistance, is required to take all necessary and reasonable steps to ensure nondiscrimination in the award and administration of contracts. Consequently, the federal regulatory provisions of 49 CFR Part 26 apply to this contract concerning the utilization of disadvantaged business enterprises. For the purposes of this Special Provision, a disadvantaged business enterprise (DBE) means a business certified by the Department in accordance with the requirements of 49 CFR Part 26 and listed in the Illinois Unified Certification Program (IL UCP) DBE Directory.

STATE OBLIGATION. This Special Provision will also be used by the Department to satisfy the requirements of the Business Enterprise for Minorities, Females, and Persons with Disabilities Act, 30 ILCS 575. When this Special Provision is used to satisfy state law requirements on 100 percent state-funded contracts, the federal government has no involvement in such contracts (not a federal-aid contract) and no responsibility to oversee the implementation of this Special Provision by the Department on those contracts. DBE participation on 100 percent state-funded contracts will not be credited toward fulfilling the Department's annual overall DBE goal required by the US Department of Transportation to comply with the federal DBE program requirements.

CONTRACTOR ASSURANCE. The Contractor makes the following assurance and agrees to include the assurance in each subcontract the Contractor signs with a subcontractor.

The Contractor, subrecipient, or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of contracts funded in whole or in part with federal or state funds. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

- (a) Withholding progress payments;
- (b) Assessing sanctions;
- (c) Liquidated damages; and/or
- (d) Disqualifying the Contractor from future bidding as non-responsible.

OVERALL GOAL SET FOR THE DEPARTMENT. As a requirement of compliance with 49 CFR Part 26, the Department has set an overall goal for DBE participation in its federally assisted contracts. That goal applies to all federal-aid funds the Department will expend in its federally assisted contracts for the subject reporting fiscal year. The Department is required to make a

good faith effort to achieve the overall goal. The dollar amount paid to all approved DBE companies performing work called for in this contract is eligible to be credited toward fulfillment of the Department's overall goal.

CONTRACT GOAL TO BE ACHIEVED BY THE CONTRACTOR. This contract includes a specific DBE utilization goal established by the Department. The goal has been included because the Department has determined the work of this contract has subcontracting opportunities that may be suitable for performance by DBE companies. The determination is based on an assessment of the type of work, the location of the work, and the availability of DBE companies to do a part of the work. The assessment indicates, in the absence of unlawful discrimination and in an arena of fair and open competition, DBE companies can be expected to perform 8.00 % of the work. This percentage is set as the DBE participation goal for this contract. Consequently, in addition to the other award criteria established for this contract, the Department will only award this contract to a bidder who makes a good faith effort to meet this goal of DBE participation in the performance of the work. A bidder makes a good faith effort for award consideration if either of the following is done in accordance with the procedures set for in this Special Provision:

- (a) The bidder documents enough DBE participation has been obtained to meet the goal or,
- (b) The bidder documents a good faith effort has been made to meet the goal, even though the effort did not succeed in obtaining enough DBE participation to meet the goal.

DBE LOCATOR REFERENCES. Bidders shall consult the IL UCP DBE Directory as a reference source for DBE-certified companies. In addition, the Department maintains a letting and item specific DBE locator information system whereby DBE companies can register their interest in providing quotes on particular bid items advertised for letting. Information concerning DBE companies willing to quote work for particular contracts may be obtained by contacting the Department's Bureau of Small Business Enterprises at telephone number (217) 785-4611, or by visiting the Department's website at:

<http://www.idot.illinois.gov/doing-business/certifications/disadvantaged-business-enterprise-certification/il-ucp-directory/index>.

BIDDING PROCEDURES. Compliance with this Special Provision is a material bidding requirement and failure of the bidder to comply will render the bid not responsive.

The bidder shall submit a DBE Utilization Plan (form SBE 2026), and a DBE Participation Statement (form SBE 2025) for each DBE company proposed for the performance of work to achieve the contract goal, with the bid. If the Utilization Plan indicates the contract goal will not be met, documentation of good faith efforts shall also be submitted. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor is selected over a DBE for work on the contract. The required forms and documentation must be submitted as a single .pdf file using the "Integrated Contractor Exchange (iCX)" application within the Department's "EBids System".

The Department will not accept a Utilization Plan if it does not meet the bidding procedures set forth herein and the bid will be declared not responsive. In the event the bid is declared not responsive, the Department may elect to cause the forfeiture of the penal sum of the bidder's proposal guaranty and may deny authorization to bid the project if re-advertised for bids.

GOOD FAITH EFFORT PROCEDURES. The contract will not be awarded until the Utilization Plan is approved. All information submitted by the bidder must be complete, accurate and adequately document enough DBE participation has been obtained or document the good faith efforts of the bidder, in the event enough DBE participation has not been obtained, before the Department will commit to the performance of the contract by the bidder. The Utilization Plan will be approved by the Department if the Utilization Plan documents sufficient commercially useful DBE work to meet the contract goal or the bidder submits sufficient documentation of a good faith effort to meet the contract goal pursuant to 49 CFR Part 26, Appendix A. This means the bidder must show that all necessary and reasonable steps were taken to achieve the contract goal. Necessary and reasonable steps are those which, by their scope, intensity and appropriateness to the objective, could reasonably be expected to obtain sufficient DBE participation, even if they were not successful. The Department will consider the quality, quantity, and intensity of the kinds of efforts the bidder has made. Mere *pro forma* efforts, in other words efforts done as a matter of form, are not good faith efforts; rather, the bidder is expected to have taken genuine efforts that would be reasonably expected of a bidder actively and aggressively trying to obtain DBE participation sufficient to meet the contract goal.

- (a) The following is a list of types of action that the Department will consider as part of the evaluation of the bidder's good faith efforts to obtain participation. These listed factors are not intended to be a mandatory checklist and are not intended to be exhaustive. Other factors or efforts brought to the attention of the Department may be relevant in appropriate cases and will be considered by the Department.
 - (1) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising and/or written notices) the interest of all certified DBE companies that have the capability to perform the work of the contract. The bidder must solicit this interest within sufficient time to allow the DBE companies to respond to the solicitation. The bidder must determine with certainty if the DBE companies are interested by taking appropriate steps to follow up initial solicitations.
 - (2) Selecting portions of the work to be performed by DBE companies in order to increase the likelihood that the DBE goals will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate DBE participation, even when the Contractor might otherwise prefer to perform these work items with its own forces.
 - (3) Providing interested DBE companies with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

- (4) a. Negotiating in good faith with interested DBE companies. It is the bidder's responsibility to make a portion of the work available to DBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DBE subcontractors and suppliers, so as to facilitate DBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of DBE companies that were considered; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for DBE companies to perform the work.
 - b. A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including DBE subcontractors, and would take a firm's price and capabilities as well as contract goals into consideration. However, the fact that there may be some additional costs involved in finding and using DBE companies is not in itself sufficient reason for a bidder's failure to meet the contract DBE goal, as long as such costs are reasonable. Also the ability or desire of a bidder to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidders are not, however, required to accept higher quotes from DBE companies if the price difference is excessive or unreasonable. In accordance with the above Bidding Procedures, the documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.
- (5) Not rejecting DBE companies as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations (for example union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.
 - (6) Making efforts to assist interested DBE companies in obtaining bonding, lines of credit, or insurance as required by the recipient or Contractor.
 - (7) Making efforts to assist interested DBE companies in obtaining necessary equipment, supplies, materials, or related assistance or services.
 - (8) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; local, state, and federal minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of DBE companies.
- (b) If the Department determines the bidder has made a good faith effort to secure the work commitment of DBE companies to meet the contract goal, the Department will award the contract provided it is otherwise eligible for award. If the Department determines the

bidder has failed to meet the requirements of this Special Provision or that a good faith effort has not been made, the Department will notify the responsible company official designated in the Utilization Plan that the bid is not responsive. The notification will also include a statement of reasons for the adverse determination. If the Utilization Plan is not approved because it is deficient as a technical matter, unless waived by the Department, the bidder will be notified and will be allowed no more than a five calendar day period to cure the deficiency.

- (c) The bidder may request administrative reconsideration of an adverse determination by emailing the Department at "DOT.DBE.UP@illinois.gov" within the five calendar days after the receipt of the notification of the determination. The determination shall become final if a request is not made on or before the fifth calendar day. A request may provide additional written documentation or argument concerning the issues raised in the determination statement of reasons, provided the documentation and arguments address efforts made prior to submitting the bid. The request will be reviewed by the Department's Reconsideration Officer. The Reconsideration Officer will extend an opportunity to the bidder to meet in person to consider all issues of documentation and whether the bidder made a good faith effort to meet the goal. After the review by the Reconsideration Officer, the bidder will be sent a written decision within ten working days after receipt of the request for reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. A final decision by the Reconsideration Officer that a good faith effort was made shall approve the Utilization Plan submitted by the bidder and shall clear the contract for award. A final decision that a good faith effort was not made shall render the bid not responsive.

CALCULATING DBE PARTICIPATION. The Utilization Plan values represent work anticipated to be performed and paid for upon satisfactory completion. The Department is only able to count toward the achievement of the overall goal and the contract goal the value of payments made for the work actually performed by DBE companies. In addition, a DBE must perform a commercially useful function on the contract to be counted. A commercially useful function is generally performed when the DBE is responsible for the work and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. The Department and Contractor are governed by the provisions of 49 CFR Part 26.55(c) on questions of commercially useful functions as it affects the work. Specific counting guidelines are provided in 49 CFR Part 26.55, the provisions of which govern over the summary contained herein.

- (a) DBE as the Contractor: 100 percent goal credit for that portion of the work performed by the DBE's own forces, including the cost of materials and supplies. Work that a DBE subcontracts to a non-DBE does not count toward the DBE goals.
- (b) DBE as a joint venture Contractor: 100 percent goal credit for that portion of the total dollar value of the contract equal to the distinct, clearly defined portion of the work performed by the DBE's own forces.

- (c) DBE as a subcontractor: 100 percent goal credit for the work of the subcontract performed by the DBE's own forces, including the cost of materials and supplies, excluding the purchase of materials and supplies or the lease of equipment by the DBE subcontractor from the Contractor or its affiliates. Work that a DBE subcontractor in turn subcontracts to a non-DBE does not count toward the DBE goal.
- (d) DBE as a trucker: 100 percent goal credit for trucking participation provided the DBE is responsible for the management and supervision of the entire trucking operation for which it is responsible. At least one truck owned, operated, licensed, and insured by the DBE must be used on the contract. Credit will be given for the following:
 - (1) The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the contract.
 - (2) The DBE may also lease trucks from a non-DBE firm, including from an owner-operator. The DBE who leases trucks from a non-DBE is entitled to credit only for the fee or commission it receives as a result of the lease arrangement.
- (e) DBE as a material supplier:
 - (1) 60 percent goal credit for the cost of the materials or supplies purchased from a DBE regular dealer.
 - (2) 100 percent goal credit for the cost of materials or supplies obtained from a DBE manufacturer.
 - (3) 100 percent credit for the value of reasonable fees and commissions for the procurement of materials and supplies if not a DBE regular dealer or DBE manufacturer.

CONTRACT COMPLIANCE. Compliance with this Special Provision is an essential part of the contract. The Department is prohibited by federal regulations from crediting the participation of a DBE included in the Utilization Plan toward either the contract goal or the Department's overall goal until the amount to be applied toward the goals has been paid to the DBE. The following administrative procedures and remedies govern the compliance by the Contractor with the contractual obligations established by the Utilization Plan. After approval of the Utilization Plan and award of the contract, the Utilization Plan and individual DBE Participation Statements become part of the contract. If the Contractor did not succeed in obtaining enough DBE participation to achieve the advertised contract goal, and the Utilization Plan was approved and contract awarded based upon a determination of good faith, the total dollar value of DBE work calculated in the approved Utilization Plan as a percentage of the awarded contract value shall become the amended contract goal. All work indicated for performance by an approved DBE shall be performed, managed, and supervised by the DBE executing the DBE Participation Commitment Statement.

- (a) NO AMENDMENT. No amendment to the Utilization Plan may be made without prior written approval from the Department's Bureau of Small Business Enterprises. All requests for amendment to the Utilization Plan shall be emailed to the Department at DOT.DBE.UP@illinois.gov.
- (b) CHANGES TO WORK. Any deviation from the DBE condition-of-award or contract plans, specifications, or special provisions must be approved, in writing, by the Department as provided elsewhere in the Contract. The Contractor shall notify affected DBEs in writing of any changes in the scope of work which result in a reduction in the dollar amount condition-of-award to the contract. Where the revision includes work committed to a new DBE subcontractor, not previously involved in the project, then a Request for Approval of Subcontractor, Department form BC 260A or AER 260A, must be signed and submitted. If the commitment of work is in the form of additional tasks assigned to an existing subcontract, a new Request for Approval of Subcontractor will not be required. However, the Contractor must document efforts to assure the existing DBE subcontractor is capable of performing the additional work and has agreed in writing to the change.
- (c) SUBCONTRACT. The Contractor must provide copies of DBE subcontracts to the Department upon request. Subcontractors shall ensure that all lower tier subcontracts or agreements with DBEs to supply labor or materials be performed in accordance with this Special Provision.
- (d) ALTERNATIVE WORK METHODS. In addition to the above requirements for reductions in the condition of award, additional requirements apply to the two cases of Contractor-initiated work substitution proposals. Where the contract allows alternate work methods which serve to delete or create underruns in condition of award DBE work, and the Contractor selects that alternate method or, where the Contractor proposes a substitute work method or material that serves to diminish or delete work committed to a DBE and replace it with other work, then the Contractor must demonstrate one of the following:
- (1) The replacement work will be performed by the same DBE (as long as the DBE is certified in the respective item of work) in a modification of the condition of award; or
 - (2) The DBE is aware its work will be deleted or will experience underruns and has agreed in writing to the change. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so; or
 - (3) The DBE is not capable of performing the replacement work or has declined to perform the work at a reasonable competitive price. If this occurs, the Contractor shall substitute other work of equivalent value to a certified DBE or provide documentation of good faith efforts to do so.

- (e) TERMINATION AND REPLACEMENT PROCEDURES. The Contractor shall not terminate or replace a DBE listed on the approved Utilization Plan, or perform with other forces work designated for a listed DBE except as provided in this Special Provision. The Contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the Contractor obtains the Department's written consent as provided in subsection (a) of this part. Unless Department consent is provided for termination of a DBE subcontractor, the Contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the DBE in the Utilization Plan.

As stated above, the Contractor shall not terminate or replace a DBE subcontractor listed in the approved Utilization Plan without prior written consent. This includes, but is not limited to, instances in which the Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Written consent will be granted only if the Bureau of Small Business Enterprises agrees, for reasons stated in its concurrence document, that the Contractor has good cause to terminate or replace the DBE firm. Before transmitting to the Bureau of Small Business Enterprises any request to terminate and/or substitute a DBE subcontractor, the Contractor shall give notice in writing to the DBE subcontractor, with a copy to the Bureau, of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor shall give the DBE five days to respond to the Contractor's notice. The DBE so notified shall advise the Bureau and the Contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why the Bureau should not approve the Contractor's action. If required in a particular case as a matter of public necessity, the Bureau may provide a response period shorter than five days.

For purposes of this paragraph, good cause includes the following circumstances:

- (1) The listed DBE subcontractor fails or refuses to execute a written contract;
- (2) The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the Contractor;
- (3) The listed DBE subcontractor fails or refuses to meet the Contractor's reasonable, nondiscriminatory bond requirements;
- (4) The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
- (5) The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant 2 CFR Parts 180, 215 and 1200 or applicable state law.

- (6) The Contractor has determined the listed DBE subcontractor is not a responsible contractor;
- (7) The listed DBE subcontractor voluntarily withdraws from the projects and provides written notice to the Contractor of its withdrawal;
- (8) The listed DBE is ineligible to receive DBE credit for the type of work required;
- (9) A DBE owner dies or becomes disabled with the result that the listed DBE subcontractor is unable to complete its work on the contract;
- (10) Other documented good cause that compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the Contractor seeks to terminate a DBE it relied upon to obtain the contract so that the Contractor can self-perform the work for which the DBE contractor was engaged or so that the Contractor can substitute another DBE or non-DBE contractor after contract award.

When a DBE is terminated or fails to complete its work on the Contract for any reason, the Contractor shall make a good faith effort to find another DBE to substitute for the original DBE to perform at least the same amount of work under the contract as the terminated DBE to the extent needed to meet the established Contract goal. The good faith efforts shall be documented by the Contractor. If the Department requests documentation under this provision, the Contractor shall submit the documentation within seven days, which may be extended for an additional seven days if necessary at the request of the Contractor. The Department will provide a written determination to the Contractor stating whether or not good faith efforts have been demonstrated.

- (f) FINAL PAYMENT. After the performance of the final item of work or delivery of material by a DBE and final payment therefore to the DBE by the Contractor, but not later than 30 calendar days after payment has been made by the Department to the Contractor for such work or material, the Contractor shall submit a DBE Payment Agreement on Department form SBE 2115 to the Resident Engineer. If full and final payment has not been made to the DBE, the DBE Payment Agreement shall indicate whether a disagreement as to the payment required exists between the Contractor and the DBE or if the Contractor believes the work has not been satisfactorily completed. If the Contractor does not have the full amount of work indicated in the Utilization Plan performed by the DBE companies indicated in the Utilization Plan and after good faith efforts are reviewed, the Department may deduct from contract payments to the Contractor the amount of the goal not achieved as liquidated and ascertained damages. The Contractor may request an administrative reconsideration of any amount deducted as damages pursuant to subsection (h) of this part.
- (g) ENFORCEMENT. The Department reserves the right to withhold payment to the Contractor to enforce the provisions of this Special Provision. Final payment shall not be

made on the contract until such time as the Contractor submits sufficient documentation demonstrating achievement of the goal in accordance with this Special Provision or after liquidated damages have been determined and collected.

- (h) RECONSIDERATION. Notwithstanding any other provision of the contract, including but not limited to Article 109.09 of the Standard Specifications, the Contractor may request administrative reconsideration of a decision to deduct the amount of the goal not achieved as liquidated damages. A request to reconsider shall be delivered to the Contract Compliance Section and shall be handled and considered in the same manner as set forth in paragraph (c) of "Good Faith Effort Procedures" of this Special Provision, except a final decision that a good faith effort was not made during contract performance to achieve the goal agreed to in the Utilization Plan shall be the final administrative decision of the Department. The result of the reconsideration process is not administratively appealable to the U.S. Department of Transportation.

80029

DISPOSAL FEES (BDE)

Effective: November 1, 2018

Replace Articles 109.04(b)(5) – 109.04(b)(8) of the Standard Specifications with the following:

- “(5) Disposal Fees. When the extra work performed includes paying for disposal fees at a clean construction and demolition debris facility, an uncontaminated soil fill operation or a landfill, the Contractor shall receive, as administrative costs, an amount equal to five percent of the first \$10,000 and one percent of any amount over \$10,000 of the total approved costs of such fees.
- (6) Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.
- (7) Statements. No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with itemized statements of the cost of such force account work. Statements shall be accompanied and supported by invoices for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor’s stock, then in lieu of the invoices, the Contractor shall furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

Itemized statements at the cost of force account work shall be detailed as follows.

- a. Name, classification, date, daily hours, total hours, rate, and extension for each laborer and foreman. Payrolls shall be submitted to substantiate actual wages paid if so requested by the Engineer.
 - b. Designation, dates, daily hours, total hours, rental rate, and extension for each unit of machinery and equipment.
 - c. Quantities of materials, prices and extensions.
 - d. Transportation of materials.
 - e. Cost of property damage, liability and workmen’s compensation insurance premiums, unemployment insurance contributions, and social security tax.
- (8) Work Performed by an Approved Subcontractor. When extra work is performed by an approved subcontractor, the Contractor shall receive, as administrative costs, an amount equal to five percent of the total approved costs of such work with the minimum payment being \$100.

- (9) All statements of the cost of force account work shall be furnished to the Engineer not later than 60 days after receipt of the Central Bureau of Construction form "Extra Work Daily Report". If the statement is not received within the specified time frame, all demands for payment for the extra work are waived and the Department is released from any and all such demands. It is the responsibility of the Contractor to ensure that all statements are received within the specified time regardless of the manner or method of delivery."

80402

ELECTRIC SERVICE INSTALLATION (BDE)

Effective: January 1, 2020

Revise Article 804.04 of the Standard Specifications to read:

“804.04 Installation. The electric service installation shall extend from the existing utility owned transformer to the point of cable termination of the incoming power at the controller enclosure.

The Contractor shall ascertain the work being provided by the electric utility and shall provide all additional material and work required to complete the electric service installation while meeting the requirements of the utility. Unless otherwise required by the utility, grounding shall be according to Section 806, raceways shall be according to Sections 810 – 812, and conductors shall be according to Sections 817 – 818.

The electric service installation shall include an appropriate service disconnect and when required, metering. Metering shall include all metering material, including potential and current transformers. The metering and service disconnect shall be installed remote to the controller enclosure where possible.

The total length of aerial and underground service between the controller enclosure and utility transformer shall not exceed 250 ft (76 m). The service pole or structure and controller shall be located adjacent to the right-of-way line or a minimum distance of 30 ft (9 m) from the edge of pavement. The exact location will be established by the Engineer.

Specific requirements for aerial and underground electric service installations shall be as follows.

- (a) **Aerial Electric Service.** The aerial service shall be mounted on a wood pole, along with a weatherhead, disconnect switch, meter base (if required), and all appurtenances to complete the installation.

The wood pole shall be installed according to Article 830.03(c), except the pole shall be a minimum of 25 ft (7.5 m) in length and shall be increased as necessary to maintain ground clearance.

- (b) **Underground Electric Service.**

- (1) **Ground Mounted Service.** The ground mounted service shall be installed on a corrosion resistant pedestal or structure with a service disconnect switch, meter base (if required), and all appurtenances to complete the installation.

- (2) **Pole Mounted Service.** The service shall be installed on a 12 ft (3.7 m) wood pole on which the meter base (if required) and service disconnect switch shall be channel

mounted. The wood pole shall be installed according to Article 830.03(c), except the pole shall be plumb.

- (c) Conduit Protection. Feeder conductors in PVC conduit on the service pole or structure shall be protected by galvanized steel "U" guard. When on a pole, the "U" guard shall be attached with 3/8 in. x 3 in. (M10 x 75 mm) galvanized steel lag bolts."

Revise Article 804.05 of the Standard Specifications to read:

"804.05 Basis of Payment. This work will be paid for at the contract unit price per each for ELECTRIC SERVICE INSTALLATION.

For aerial electric service, work on the utility side of the weatherhead at the service pole will be paid for according to Article 109.04 when not provided by the utility company.

For underground electric service, work on the utility side of the service pole, pedestal, or structure where the service cables penetrate the ground will be paid for according to Article 109.04 when not provided by the utility company.

Any charges by the utility company to provide electrical service will be paid for according to Article 109.05."

80421

EMULSIFIED ASPHALTS (BDE)

Effective: August 1, 2019

Revise Article 1032.06 of the Standard Specifications to read:

“1032.06 Emulsified Asphalts. Emulsified asphalts will be accepted according to the current Bureau of Materials Policy Memorandum, “Emulsified Asphalt Acceptance Procedure”. These materials shall be homogeneous and shall show no separation of asphalt after thorough mixing, within 30 days after delivery, provided separation has not been caused by freezing. They shall coat the aggregate being used in the work to the satisfaction of the Engineer and shall be according to the following requirements.

- (a) Anionic Emulsified Asphalt. Anionic emulsified asphalts RS-1, RS-2, HFRS-2, SS-1h, and SS-1 shall be according to AASHTO M 140, except as follows.
 - (1) The cement mixing test will be waived when the emulsion is being used as a tack coat.
 - (2) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.
- (b) Cationic Emulsified Asphalt. Cationic emulsified asphalts CRS-1, CRS-2, CSS-1h, and CSS-1 shall be according to AASHTO M 208, except as follows.
 - (1) The cement mixing test will be waived when the emulsion is being used as a tack coat.
 - (2) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.
- (c) High Float Emulsion. High float emulsions HFE-90, HFE-150, and HFE-300 are medium setting and shall be according to the following table.

Test	HFE-90	HFE-150	HFE-300
Viscosity, Saybolt Furol, at 122 °F (50 °C), (AASHTO T 59), SFS ^{1/}	50 min.	50 min.	50 min.
Sieve Test, No. 20 (850 µm), retained on sieve, (AASHTO T 59), %	0.10 max.	0.10 max.	0.10 max.
Storage Stability Test, 1 day, (AASHTO T 59), %	1 max.	1 max.	1 max.
Coating Test (All Grades), (AASHTO T 59), 3 minutes	stone coated thoroughly		
Distillation Test, (AASHTO T 59): Residue from distillation test to 500 °F (260 °C), % Oil distillate by volume, %	65 min. 7 max.	65 min. 7 max.	65 min. 7 max.

Characteristics of residue from distillation test to 500 °F (260 °C): Penetration at 77 °F (25 °C), (AASHTO T 49), 100 g, 5 sec, dmm	90-150	150-300	300 min.
Float Test at 140 °F (60 °C), (AASHTO T 50), sec.	1200 min.	1200 min.	1200 min.

1/ The emulsion shall be pumpable.

- (d) Penetrating Emulsified Prime. Penetrating Emulsified Prime (PEP) shall be according to AASHTO T 59, except as follows.

Test	Result
Viscosity, Saybolt Furol, at 77 °F (25 °C), SFS	75 max.
Sieve test, retained on No. 20 (850 µm) sieve, %	0.10 max.
Distillation to 500 °F (260 °C) residue, %	38 min.
Oil distillate by volume, %	4 max.

The PEP shall be tested according to the current Bureau of Materials Illinois Laboratory Test Procedure (ILTP), "Sand Penetration Test of Penetrating Emulsified Prime (PEP)". The time of penetration shall be equal to or less than that of MC-30. The depth of penetration shall be equal to or greater than that of MC-30.

- (e) Delete this subparagraph.
- (f) Polymer Modified Emulsified Asphalt. Polymer modified emulsified asphalts, e.g. SS-1hP, CSS-1hP, CRS-2P (formerly CRSP), CQS-1hP (formerly CSS-1h Latex Modified) and HFRS-2P (formerly HFP) shall be according to AASHTO M 316, except as follows.
- (1) The cement mixing test will be waived when the polymer modified emulsion is being used as a tack coat.
 - (2) CQS-1hP (formerly CSS-1h Latex Modified) emulsion for micro-surfacing treatments shall use latex as the modifier.
 - (3) Upon examination of the storage stability test cylinder after standing undisturbed for 24 hours, the surface shall show minimal to no white, milky colored substance and shall be a homogenous brown color throughout.
 - (4) The distillation for all polymer modified emulsions shall be performed according to AASHTO T 59, except the temperature shall be 374 ± 9 °F (190 ± 5 °C) to be held for a period of 15 minutes and measured using an ASTM 16F (16C) thermometer.
 - (5) The specified temperature for the Elastic Recovery test for all polymer modified emulsions shall be 50.0 ± 1.0 °F (10.0 ± 0.5 °C).

(6) The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent.

(g) Non-Tracking Emulsified Asphalt. Non-tracking emulsified asphalt NTEA (formerly SS-1vh) shall be according to the following.

Test	Requirement
Saybolt Viscosity at 77 °F (25 °C), (AASHTO T 59), SFS	20-100
Storage Stability Test, 24 hr, (AASHTO T 59), %	1 max.
Residue by Distillation, 500 ± 10 °F (260 ± 5 °C), or Residue by Evaporation, 325 ± 5 °F (163 ± 3 °C), (AASHTO T 59), %	50 min.
Sieve Test, No. 20 (850 µm), (AASHTO T 59), %	0.3 max.
Tests on Residue from Evaporation	
Penetration at 77 °F (25 °C), 100 g, 5 sec, (AASHTO T 49), dmm	40 max.
Softening Point, (AASHTO T 53), °F (°C)	135 (57) min.
Ash Content, (AASHTO T 111), % ^{1/}	1 max.

1/ The Solubility in Trichloroethylene test according to AASHTO T 44 may be run in lieu of Ash Content and shall meet a minimum of 97.5 percent

The different grades are, in general, used for the following.

Grade	Use
SS-1, SS-1h, RS-1, RS-2, CSS-1, CRS-1, CRS-2, CSS-1h, HFE-90, SS-1hP, CSS-1hP, NTEA (formerly SS-1vh)	Tack Coat
PEP	Prime Coat
RS-2, HFE-90, HFE-150, HFE-300, CRS-2P (formerly CRSP), HFRS-2P (formerly HFP), CRS-2, HFRS-2	Bituminous Surface Treatment
CQS-1hP (formerly CSS-1h Latex Modified)	Micro-Surfacing Slurry Sealing Cape Seal"

80415

ENGINEER'S FIELD OFFICE AND LABORATORY (BDE)

Effective: January 1, 2020

Revise the last sentence of the first paragraph of Article 670.01 of the Standard Specifications to read:

“The building shall remain available for use until released by the Engineer.”

Revise the fifth and sixth paragraphs of Article 670.02 of the Standard Specifications to read:

“Sanitary facilities shall include hot and cold potable running water, lavatory and toilet as an integral part of the office where available. A portable toilet, if necessary, shall be serviced once per week. Solid waste disposal consisting of two waste baskets and an outside trash container of sufficient size to accommodate a weekly provided pick-up service.

In addition, the following furniture and equipment meeting the approval of the Engineer shall be furnished.”

Revise Article 670.02(b) through 670.02(r) of the Standard Specifications to read:

- “(b) One desk with minimum working surface of 48 x 72 in. (1.2 x 1.8 m).
- (c) Two free standing four drawer legal size file cabinets with lock and an underwriters' laboratories insulated file device 350 degrees one hour rating.
- (d) Table(s) and chairs capable of seating 10 people.
- (e) One equipment cabinet of minimum inside dimension of 44 in. (1100 mm) high x 24 in. (600 mm) wide x 30 in. (750 mm) deep with lock. The walls shall be of steel with a 3/32 in. (2 mm) minimum thickness with concealed hinges and enclosed lock constructed in such a manner as to prevent entry by force. The cabinet assembly shall be permanently attached to a structural element of the field office in a manner to prevent theft of the entire cabinet.
- (f) One refrigerator with a minimum size of 14 cu ft (0.40 cu m) with a freezer unit.
- (g) One electric desk type tape printing calculator.
- (h) A minimum of two communication paths. The configuration shall include:
 - (1) Internet Connection. An internet service connection with a wireless router capable of providing service to a minimum of five devices. The internet service shall be for unlimited data with a minimum internet data download speed of 25 megabits per second. For areas where this minimum download speed is not available, the maximum speed available for the area shall be provided.

- (2) Telephone Line. One landline touch tone telephone with voicemail or answering machine. The telephone shall have an unpublished number.
- (i) One plain paper wireless color printer capable of reproducing prints up to 11 x 17 in. (280 x 432 mm) with an automatic feed tray. Separate paper trays for letter size and 11 x 17 in. (280 x 432 mm) paper shall be provided. The wireless printer shall also be equipped to copy in color and scan documents.
- (j) One electric water cooler dispenser.
- (k) One first-aid cabinet fully equipped.
- (l) One microwave oven (minimum 700 watt) with a turntable and 1 cu ft (0.03 cu m) minimum capacity.
- (m) One fire-proof safe, 0.5 cu ft (0.01 cu m) minimum capacity.
- (n) One electric paper shredder.
- (o) One post mounted rain gauge, located on the project site for each 5 miles (8 km) of project length.”

Revise the last sentence of the first paragraph of Articles 670.04 and 670.05 of the Standard Specifications to read:

“Doors and windows shall be equipped with locks.”

Revise Article 670.04(c) through 670.04(n) of the Standard Specifications to read:

“(c) Two folding chairs.

(d) One equipment cabinet of minimum inside dimension of 44 in. (1100 mm) high x 24 in. (600 mm) wide x 30 in. (750 mm) deep with lock. The walls shall be of steel with a 3/32 in. (2 mm) minimum thickness with concealed hinges and enclosed lock constructed to prevent entry by force. The cabinet assembly shall be permanently attached to a structural element of the field office to prevent theft of the entire cabinet.

(e) A minimum of two communication paths. The configuration shall include:

(1) Internet Connection. An internet service connection with a wireless router capable of providing service to a minimum of five devices. The internet service shall be for unlimited data with a minimum internet download speed of 25 megabits per second. For areas where this minimum download speed is not available, the maximum speed available for the area shall be provided.

(2) Telephone Line. One land line touch tone telephone with voicemail or answering machine. The telephone shall have an unpublished number.

(f) One electric desk type tape printing calculator.

(g) One first-aid cabinet fully equipped.

(h) One plain paper wireless color printer capable of reproducing prints up to 11 x 17 in. (280 x 432 mm) with an automatic feed tray. Separate paper trays for letter size and 11 x 17 in. (280 x 432 mm) paper shall be provided. The wireless printer shall also be equipped to copy in color and scan documents.

(i) A portable toilet meeting Federal, State, and local health department requirements shall be provided, maintained clean and in good working condition, and shall be stocked with lavatory and sanitary supplies at all times. The portable toilet shall be serviced once per week.

(j) One electric water cooler dispenser.

(k) One refrigerator with a minimum size of 14 cu ft (0.45 cu m) with a freezer unit.

(l) One microwave oven (minimum 700 watt) with a turntable and 1 cu ft (0.03 cu m) minimum capacity.”

Revise Article 670.05(f) of the Standard Specifications to read:

“(f) One landline touch tone telephone with voicemail or an answering machine. The telephone shall have an unpublished number.”

Delete the last sentence of the second paragraph of Article 670.06 of the Standard Specifications.

Revise the fifth sentence of the first paragraph of Article 670.07 of the Supplemental Specifications to read:

“This price shall include all utility costs and shall reflect the salvage value of the building or buildings, equipment, and furniture which remain the property of the Contractor after release by the Engineer, except the Department will pay that portion of the monthly long distance and monthly local telephone, when combined, exceed \$250.”

80423

FUEL COST ADJUSTMENT (BDE)

Effective: April 1, 2009

Revised: August 1, 2017

Description. Fuel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in fuel prices when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract. Failure to indicate "Yes" for any category of work will make that category of work exempt from fuel cost adjustment.

General. The fuel cost adjustment shall apply to contract pay items as grouped by category. The adjustment shall only apply to those categories of work checked "Yes", and only when the cumulative plan quantities for a category exceed the required threshold. Adjustments to work items in a category, either up or down, and extra work paid for by agreed unit price will be subject to fuel cost adjustment only when the category representing the added work was subject to the fuel cost adjustment. Extra work paid for at a lump sum price or by force account will not be subject to fuel cost adjustment. Category descriptions and thresholds for application and the fuel usage factors which are applicable to each are as follows:

(a) Categories of Work.

- (1) Category A: Earthwork. Contract pay items performed under Sections 202, 204, and 206 including any modified standard or nonstandard items where the character of the work to be performed is considered earthwork. The cumulative total of all applicable item plan quantities shall exceed 25,000 cu yd (20,000 cu m). Included in the fuel usage factor is a weighted average 0.10 gal/cu yd (0.50 liters/cu m) factor for trucking.
- (2) Category B: Subbases and Aggregate Base Courses. Contract pay items constructed under Sections 311, 312 and 351 including any modified standard or nonstandard items where the character of the work to be performed is considered construction of a subbase or aggregate, stabilized or modified base course. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is a 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.
- (3) Category C: Hot-Mix Asphalt (HMA) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 355, 406, 407 and 482 including any modified standard or nonstandard items where the character of the work to be performed is considered HMA bases, pavements and shoulders. The cumulative total of all applicable item plan quantities shall exceed 5000 tons (4500 metric tons). Included in the fuel usage factor is 0.60 gal/ton (2.50 liters/metric ton) factor for trucking.
- (4) Category D: Portland Cement Concrete (PCC) Bases, Pavements and Shoulders. Contract pay items constructed under Sections 353, 420, 421 and 483 including any

modified standard or nonstandard items where the character of the work to be performed is considered PCC base, pavement or shoulder. The cumulative total of all applicable item plan quantities shall exceed 7500 sq yd (6000 sq m). Included in the fuel usage factor is 1.20 gal/cu yd (5.94 liters/cu m) factor for trucking.

- (5) Category E: Structures. Structure items having a cumulative bid price that exceeds \$250,000 for pay items constructed under Sections 502, 503, 504, 505, 512, 516 and 540 including any modified standard or nonstandard items where the character of the work to be performed is considered structure work when similar to that performed under these sections and not included in categories A through D.

(b) Fuel Usage Factors.

English Units		
Category	Factor	Units
A - Earthwork	0.34	gal / cu yd
B - Subbase and Aggregate Base courses	0.62	gal / ton
C - HMA Bases, Pavements and Shoulders	1.05	gal / ton
D - PCC Bases, Pavements and Shoulders	2.53	gal / cu yd
E - Structures	8.00	gal / \$1000

Metric Units		
Category	Factor	Units
A - Earthwork	1.68	liters / cu m
B - Subbase and Aggregate Base courses	2.58	liters / metric ton
C - HMA Bases, Pavements and Shoulders	4.37	liters / metric ton
D - PCC Bases, Pavements and Shoulders	12.52	liters / cu m
E - Structures	30.28	liters / \$1000

(c) Quantity Conversion Factors.

Category	Conversion	Factor
B	sq yd to ton	0.057 ton / sq yd / in depth
	sq m to metric ton	0.00243 metric ton / sq m / mm depth
C	sq yd to ton	0.056 ton / sq yd / in depth
	sq m to metric ton	0.00239 m ton / sq m / mm depth
D	sq yd to cu yd	0.028 cu yd / sq yd / in depth
	sq m to cu m	0.001 cu m / sq m / mm depth

Method of Adjustment. Fuel cost adjustments will be computed as follows.

$$CA = (FPI_P - FPI_L) \times FUF \times Q$$

Where: CA = Cost Adjustment, \$
FPI_P = Fuel Price Index, as published by the Department for the month the work is performed, \$/gal (\$/liter)
FPI_L = Fuel Price Index, as published by the Department for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price, \$/gal (\$/liter)
FUF = Fuel Usage Factor in the pay item(s) being adjusted
Q = Authorized construction Quantity, tons (metric tons) or cu yd (cu m)

The entire FUF indicated in paragraph (b) will be used regardless of use of trucking to perform the work.

Basis of Payment. Fuel cost adjustments may be positive or negative but will only be made when there is a difference between the FPI_L and FPI_P in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(FPI_L - FPI_P) \div FPI_L\} \times 100$$

Fuel cost adjustments will be calculated for each calendar month in which applicable work is performed; and will be paid or deducted when all other contract requirements for the items of work are satisfied. The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

80229

GEOTECHNICAL FABRIC FOR PIPE UNDERDRAINS AND FRENCH DRAINS (BDE)

Effective: November 1, 2019

Revise Article 1080.01(a) of the Standard Specifications to read:

“(a) Fabric Materials. Fabric materials shall be as follows.

- (1) Knitted Fabric. Knitted fabric envelope shall be Type A according to ASTM D 6707 and be a continuous one piece knitted polymeric material that fits over the pipe underdrain like a sleeve. It shall be free from any chemical treatment or coating that might significantly reduce porosity and permittivity.
- (2) Woven or Nonwoven Fabric. The fabric shall be Class 3 according to AASHTO M 288 and consist of woven yarns or nonwoven filaments of polyolefins or polyesters. Woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape like character) shall not be permitted. The yarns or filaments shall be dimensionally stable (i.e. maintain their relative position with respect to each other) and resistant to delamination. The yarns or filaments shall be free from any chemical treatment or coating that might significantly reduce porosity and permittivity.
- (3) Physical Properties. The physical properties for knitted, woven, and nonwoven fabrics shall be according to the following.

PHYSICAL PROPERTIES			
	Knitted ^{1/}	Woven ^{2/}	Nonwoven ^{2/}
Grab Strength, lb (N) ASTM D 4632 ^{3/}	--	180 (800) min.	112 (500) min.
Elongation/Grab Strain, % ASTM D 4632 ^{3/}	--	49 max.	50 min.
Trapezoidal Tear Strength, lb (N) ASTM D 4533 ^{3/}	--	67 (300) min.	40 (180) min.
Puncture Strength, lb (N) ASTM D 6241 ^{3/}	180 (800) min.	370 (1650) min.	222 (990) min.
Apparent Opening Size, Sieve No. (mm) ASTM D 4751 ^{4/}	30 (0.60) max.	40 (0.425) max.	40 (0.425) max.
Permittivity, sec ⁻¹ ASTM D 4491	1.0 min.		
Ultraviolet Stability, % retained strength after 500 hours of exposure ASTM D 4355	--	50 min.	50 min.

1/ Manufacturer's certification to meet test requirements.

2/ NTPEP results or manufacturer's certification to meet test requirements.

3/ Values represent the minimum average roll value (MARV) in the weaker principle direction [machine direction (MD) or cross-machine direction (XD)].

4/ Values represent the maximum average roll value.”

Revise Article 1080.05 of the Standard Specifications to read:

“1080.05 Geotechnical Fabric for French Drains and Pipe Underdrains, Type 2. Geotechnical fabric for french drains and pipe underdrains, Type 2 shall be Class 3 according to AASHTO M 288 and consist of woven yarns or nonwoven filaments of polyolefins or polyesters. Woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character) shall not be permitted. The yarns or filaments shall be dimensionally stable (i.e. maintain their relative position with respect to each other) and resistant to delamination. The yarns or filaments shall be free from any chemical treatment or coating that might significantly reduce porosity and permittivity.

The fabric shall be according to the following.

PHYSICAL PROPERTIES ^{1/}		
	Woven	Nonwoven
Grab Strength, lb (N) ASTM D 4632 ^{2/}	180 (800) min.	112 (500) min.
Elongation/Grab Strain, % ASTM D 4632 ^{2/}	49 max.	50 min.
Trapezoidal Tear Strength, lb (N) ASTM D 4533 ^{2/}	67 (300) min.	40 (180) min.
Puncture Strength, lb (N) ASTM D 6241 ^{2/}	370 (1650) min.	222 (990) min.
Apparent Opening Size, Sieve No. (mm) ASTM D 4751 ^{3/}	60 (0.25) max.	
Permittivity, sec ⁻¹ ASTM D 4491	0.2 min.	
Ultraviolet Stability % retained strength after 500 hours of exposure - ASTM D 4355	50 min.	

1/ NTPEP results to meet test requirements. Manufacturer shall have public release status and current reports on laboratory results in Test Data of NTPEP’s DataMine.

2/ Values represent the minimum average roll value (MARV) in the weaker principle direction [machine direction (MD) or cross-machine direction (XD)].

3/ Values represent the maximum average roll value.”

HOT-MIX ASPHALT – BINDER AND SURFACE COURSE (BDE)

Effective: July 2, 2019
 Revised: November 1, 2019

Description. This work shall consist of constructing a hot-mix asphalt (HMA) binder and/or surface course on a prepared base. Work shall be according to Sections 406 and 1030 of the Standard Specifications, except as modified herein.

Materials. Add the following after the second paragraph of Article 1003.03(c):

“For mixture IL-9.5FG, at least 67 percent of the required fine aggregate fraction shall consist of either stone sand, slag sand, steel slag sand, or combinations thereof meeting FA 20 gradation.”

Revise Article 1004.03(c) to read:

“(c) Gradation. The coarse aggregate gradations shall be as listed in the following table.

Use	Size/Application	Gradation No.
Class A-1, A-2, & A-3	3/8 in. (10 mm) Seal	CA 16 or CA 20
Class A-1	1/2 in. (13 mm) Seal	CA 15
Class A-2 & A-3	Cover Coat	CA 14
HMA High ESAL	IL-19.0	CA 11 ^{1/}
	SMA 12.5 ^{2/}	CA 13, CA 14, or CA 16
	SMA 9.5 ^{2/}	CA 13 or CA 16 ^{3/}
	IL-9.5	CA 16
	IL-9.5FG	CA 16
HMA Low ESAL	IL-19.0L	CA 11 ^{1/}
	IL-9.5L	CA 16

1/ CA 16 or CA 13 may be blended with the CA 11.

2/ The coarse aggregates used shall be capable of being combined with stone sand, slag sand, or steel slag sand meeting the FA/FM 20 gradation and mineral filler to meet the approved mix design and the mix requirements noted herein.

3/ The specified coarse aggregate gradations may be blended.”

HMA Nomenclature. Revise the “High ESAL” portion of the table in Article 1030.01 to read:

“High ESAL	Binder Courses	IL-19.0, IL-9.5, IL-9.5FG, IL-4.75, SMA 12.5, SMA 9.5
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	Surface Courses	IL-9.5, IL-9.5FG, SMA 12.5, SMA 9.5”
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Mixture Design. Revise the table in Article 1030.04(a)(1) and add SMA 9.5 and IL-9.5FG mixture compositions as follows:

“HIGH ESAL, MIXTURE COMPOSITION (% PASSING) ^{1/}						
Sieve Size	SMA 12.5 ^{5/}		SMA 9.5 ^{5/}		IL-9.5FG	
	min.	max.	min.	max.	min.	max.
1 in. (25 mm)						
3/4 in. (19 mm)		100		100		
1/2 in. (12.5 mm)	90	99	95	100		100
3/8 in. (9.5 mm)	50	85	70	95	90	100
#4 4.75 mm)	20	40	30	50	60	75
#8 (2.36 mm)	16	24 ^{4/}	20	30	45	60
#16 (1.18 mm)				21	25	40
#30 (600 μm)				18	15	30
#50 (300 μm)				15	8	15
#100 (150 μm)					6	10
#200 (75 μm)	8.0	11.0 ^{3/}	8.0	11.0 ^{3/}	4.0	6.5
#635 (20 μm)		≤ 3.0		≤ 3.0		
Ratio of Dust/Asphalt Binder						1.0

1/ Based on percent of total aggregate weight.

2/ The mixture composition shall not exceed 44 percent passing the #8 (2.36 mm) sieve for surface courses with N_{design} = 90.

- 3/ Additional minus No. 200 (0.075 mm) material required by the mix design shall be mineral filler, unless otherwise approved by the Engineer.
- 4/ When establishing the adjusted job mix formula (AJMF) the percent passing the #8 (2.36 mm) sieve shall not be adjusted above 24 percent.
- 5/ When the bulk specific gravity (Gsb) of the component aggregates vary by more than 0.2, the blend gradations shall be based on volumetric percentage.”

Revise the table in Article 1030.04(b)(1) to read:

“VOLUMETRIC REQUIREMENTS, High ESAL				
Ndesign	Voids in the Mineral Aggregate (VMA), % minimum			Voids Filled with Asphalt Binder (VFA), %
	IL-19.0	IL-9.5 IL-9.5FG	IL-4.75 ^{1/}	
50	13.5	15.0	18.5	65 - 78 ^{2/}
70			65 – 75 ^{3/}	
90				

- 1/ Maximum draindown for IL-4.75 shall be 0.3 percent.
- 2/ VFA for IL-4.75 shall be 76-83 percent.
- 3/ VFA for IL-9.5FG shall be 65-78 percent.”

Revise the table in Article 1030.04(b)(3) to read:

“VOLUMETRIC REQUIREMENTS, SMA 12.5 ^{1/} and SMA 9.5 ^{1/}				
ESALs (million)	Ndesign	Design Air Voids Target, %	Voids in the Mineral Aggregate (VMA), % min.	Voids Filled with Asphalt (VFA), %
≤ 10	50	4.0	16.0	75 – 80
> 10	80	4.0	17.0	75 – 80

- 1/ Maximum draindown shall be 0.3 percent.”

Quality Control/Quality Assurance (QC/QA). Revise the third paragraph of Article 1030.05(d)(3) to read:

“If the Contractor and Engineer agree the nuclear density test method is not appropriate for the mixture, cores shall be taken at random locations determined according to the

QC/QA document "Determination of Random Density Test Site Locations". Core densities shall be determined using the Illinois Modified AASHTO T 166 or T 275 procedure."

Add the following paragraphs to the end of Article 1030.05(d)(3):

"Longitudinal joint density testing shall be performed at each random density test location. Longitudinal joint testing shall be located at a distance equal to the lift thickness or a minimum of 4 in. (100 mm), from each pavement edge (i.e. for a 5 in. (125 mm) lift the near edge of the density gauge or core barrel shall be within 5 in. (125 mm) from the edge of pavement). Longitudinal joint density testing shall be performed using either a correlated nuclear gauge or cores.

- a. Confined Edge. Each confined edge density shall be represented by a one-minute nuclear density reading or a core density and shall be included in the average of density readings or core densities taken across the mat which represents the Individual Test.
- b. Unconfined Edge. Each unconfined edge joint density shall be represented by an average of three one-minute density readings or a single core density at the given density test location and shall meet the density requirements specified herein. The three one-minute readings shall be spaced 10 ft (3 m) apart longitudinally along the unconfined pavement edge and centered at the random density test location.

When a longitudinal joint sealant (LJS) is applied, longitudinal joint density testing will not be required on the joint(s) sealed."

Revise the second table in Article 1030.05(d)(4) and its notes to read:

"DENSITY CONTROL LIMITS			
Mixture Composition	Parameter	Individual Test (includes confined edges)	Unconfined Edge Joint Density, minimum
IL-4.75	Ndesign = 50	93.0 – 97.4 % ^{1/}	91.0%
IL-9.5FG	Ndesign = 50 - 90	93.0 – 97.4 %	91.0%
IL-9.5	Ndesign = 90	92.0 – 96.0 %	90.0%
IL-9.5, IL-9.5L,	Ndesign < 90	92.5 – 97.4 %	90.0%
IL-19.0	Ndesign = 90	93.0 – 96.0 %	90.0%
IL-19.0, IL-19.0L	Ndesign < 90	93.0 ^{2/} – 97.4 %	90.0%
SMA	Ndesign = 50 or 80	93.5 – 97.4 %	91.0%

1/ Density shall be determined by cores or by correlated, approved thin lift nuclear gauge.

2/ 92.0 % when placed as first lift on an unimproved subgrade.”

Equipment. Add the following to Article 1101.01 of the Standard Specifications:

“(h) Oscillatory Roller. The oscillatory roller shall be self-propelled and provide a smooth operation when starting, stopping, or reversing directions. The oscillatory roller shall be able to operate in a mode that will provide tangential impact force with or without vertical impact force by using at least one drum. The oscillatory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used to wet the drums to prevent material pickup. The drum(s) amplitude and frequency of the tangential and vertical impact force shall be approximately the same in each direction and meet the following requirements:

- (1) The minimum diameter of the drum(s) shall be 42 in. (1070 mm);
- (2) The minimum length of the drum(s) shall be 57 in. (1480 mm);
- (3) The minimum unit static force on the drum(s) shall be 125 lb/in. (22 N/m); and
- (4) The minimum force on the oscillatory drum shall be 18,000 lb (80 kN).”

CONSTRUCTION REQUIREMENTS

Add the following to Article 406.03 of the Standard Specifications:

“(j) Oscillatory Roller 1101.01”

Revise the third paragraph of Article 406.05(a) to read:

“All depressions of 1 in. (25 mm) or more in the surface of the existing pavement shall be filled with binder. At locations where heavy disintegration and deep spalling exists, the area shall be cleaned of all loose and unsound material, tacked, and filled with binder (hand method).”

Revise Article 406.05(c) to read.

“(c) Binder (Hand Method). Binder placed other than with a finishing machine will be designated as binder (hand method) and shall be compacted with a roller to the satisfaction of the Engineer. Hand tamping will be permitted when approved by the Engineer.”

Revise the special conditions for mixture IL-4.75 in Article 406.06(b)(2)e. to read:

“e. The mixture shall be overlaid within 5 days of being placed.”

Revise Article 406.06(d) to read:

“(d) Lift Thickness. The minimum compacted lift thickness for HMA binder and surface courses shall be as follows.

MINIMUM COMPACTED LIFT THICKNESS	
Mixture Composition	Thickness, in. (mm)
IL-4.75	3/4 (19) - over HMA surfaces ^{1/} 1 (25) - over PCC surfaces ^{1/}
IL-9.5FG	1 1/4 (32)
IL-9.5, IL-9.5L	1 1/2 (38)
SMA 9.5	1 1/2 (38)
SMA 12.5	2 (51)
IL-19.0, IL-19.0L	2 1/4 (57)

1/ The maximum compacted lift thickness for mixture IL-4.75 shall be 1 1/4 in. (32 mm).”

Revise Table 1 and Note 3/ of Table 1 in Article 406.07(a) of the Standard Specifications to read:

“TABLE 1 - MINIMUM ROLLER REQUIREMENTS FOR HMA				
	Breakdown Roller (one of the following)	Intermediate Roller	Final Roller (one or more of the following)	Density Requirement
Binder and Surface ^{1/}	V _D , P ^{3/} , T _B , 3W, O _T , O _B	P ^{3/} , O _T , O _B	V _S , T _B , T _F , O _T	As specified in Articles: 1030.05(d)(3), (d)(4), and (d)(7).
IL-4.75 and SMA ^{4/ 5/}	T _B , 3W, O _T	--	T _F , 3W, O _T	
Bridge Decks ^{2/}	T _B	--	T _F	As specified in Articles 582.05 and 582.06.

3/ A vibratory roller (V_D) or oscillatory roller (O_T or O_B) may be used in lieu of the pneumatic-tired roller on mixtures containing polymer modified asphalt binder.”

Add the following to EQUIPMENT DEFINITION in Article 406.07(a) contained in the Errata of the Supplemental Specifications:

“O_T - Oscillatory roller, tangential impact mode. Maximum speed is 3.0 mph (4.8 km/h) or 264 ft/min (80 m/min).

O_B - Oscillatory roller, tangential and vertical impact mode, operated at a speed to produce not less than 10 vertical impacts/ft (30 impacts/m).”

Basis of Payment. Replace the second through the fifth paragraphs of Article 406.14 with the following:

“HMA binder and surface courses will be paid for at the contract unit price per ton (metric ton) for MIXTURE FOR CRACKS, JOINTS, AND FLANGEWAYS; HOT-MIX ASPHALT BINDER COURSE (HAND METHOD), of the Ndesign specified; HOT-MIX ASPHALT BINDER COURSE, of the mixture composition and Ndesign specified; HOT-MIX ASPHALT SURFACE COURSE, of the mixture composition, friction aggregate, and Ndesign specified; POLYMERIZED HOT-MIX ASPHALT BINDER COURSE (HAND METHOD), of the Ndesign specified; POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, of the mixture composition and Ndesign specified; POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, of the mixture composition, friction aggregate, and Ndesign specified; POLYMERIZED HOT-MIX ASPHALT BINDER COURSE, STONE MATRIX ASPHALT, of the mixture composition and Ndesign specified; POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, STONE MATRIX ASPHALT, of the mixture composition, friction aggregate, and Ndesign specified.”

80416

LUMINAIRES, LED (BDE)

Effective: April 1, 2019

Description. This work shall consist of furnishing and installing light emitting diode (LED) luminaires. Work shall be according to Sections 801, 821, and 1067 of the Standard Specifications, except as modified herein.

Submittals. In addition to the requirements listed in Article 801.05(a), submittals for LED luminaires shall include the following.

- Completed manufacturer's luminaire ordering form with the full catalog number provided.
- Descriptive literature and catalog cuts for the luminaire, driver, and surge protective device.
- Lighting calculations generated with AGi32 software demonstrating compliance with the Luminaire Performance Table shown in the contract. These calculations shall be performed to the following criteria: photopic units shall be used; calculations shall be performed to an accuracy of two digits ($x.xx \text{ cd/m}^2$); point-by-point illuminance, luminance, and veiling luminance ratios demonstrating that the submitted luminaire meets the lighting metrics specified in the Luminaire Performance Table using IES RP-8 methods.

Upon request by the Engineer, submittals for LED Luminaires shall also include any or all the following.

- IES file associated with each submitted luminaire in IES LM-63 format.
- TM-21 calculator spreadsheet (XLSX or PDF format) and if available, TM-28 report for the specified luminaire or luminaire family. Both reports shall be for 50,000 hours at an ambient temperature of 77 °F (25 °C).
- LM-79 report with National Voluntary Laboratory Accreditation Program (NVLAP) current at the time of testing in PDF format inclusive of the following: isofootcandle diagram with half candela contour and maximum candela point; polar plots through maximum plane and maximum cone; coefficient of utilization graph; candela table; and spectral distribution graph and chromaticity diagram.
- LM-80 report for the specified LED package in PDF format and if available, LM-84 report for the specified luminaire or luminaire family in PDF format. Both reports shall be conducted by a laboratory with NVLAP certification current at the time of testing.
- In Situ Temperature Measurement Test (ISTMT) report for the specified luminaire or luminaire family in PDF format.
- Vibration test report in accordance with ANSI C136.31 in PDF format.

- ASTM B117/ASTM D1654 (neutral salt spray) test and sample evaluation report in PDF format.
- ASTM G154 (ASTM D523) gloss test report in PDF format.
- LED drive current, total luminaire input wattage, and current over the operating voltage range at an ambient temperature of 77 °F (25 °C).
- Power factor (pf) and total harmonic distortion (THD) at maximum and minimum supply and at nominal voltage for the dimmed states of 70%, 50%, and 30% full power.
- Ingress protection (IP) test reports, conducted according to ANSI C136.25 requirements, for the driver and optical assembly in PDF format.
- Installation, maintenance, and cleaning instructions in PDF format, including recommendations on periodic cleaning methods.
- Documentation in PDF format that the reporting laboratory is certified to perform the required tests.

Warranty. Replace the last sentence of Article 801.14(a) with the following.

“The warranty, including the maintained minimum luminance, for LED signal head modules, optically programmed LED signal head modules, and LED pedestrian signal head modules shall cover a minimum of 60 months from the date of delivery. The warranty for LED roadway luminaires, LED highmast luminaires, LED underpass luminaires, LED sign lighting luminaires, LED obstruction warning luminaires, and all of their components shall cover a minimum of ten years from the date of delivery.”

Roadway Luminaires. Revise Article 821.02(d) to read.

“(d) Light Source1067.06”

Revise the third paragraph of Article 821.03 to read.

“Each luminaire driver and/or driver arrangement shall be checked to assure compatibility with the project power supply. When the luminaire driver has a readily accessible electrical compartment, the driver shall be attached so as to be easily removed for maintenance.”

Replace the fifth paragraph of Article 821.03 with the following.

“No luminaire shall be installed before it is approved. When independent luminaire testing is required, full approval will not be given until complete test results which demonstrate compliance with the contract documents have been reviewed and accepted by the Engineer. Independent luminaire testing will be required, and shall be conducted, according to Article 1067.01(k)”.

Revise the last paragraph of Article 821.03 to read.

“When installing or adjusting the luminaire, care shall be taken to avoid touching the lenses or allowing contaminants to be deposited on any part of the optical assembly. Each lens shall be free of all dirt, smudges, etc. Should the luminaire require cleaning, the luminaire manufacturer’s cleaning instructions shall be strictly followed.”

Revise Article 821.08 to read.

“821.08 Basis of Payment. This work will be paid for at the contract unit price per each for LUMINAIRE, LED, ROADWAY, of the output designation specified; LUMINAIRE, LED, HIGHMAST, of the output designation specified; LUMINAIRE, LED, UNDERPASS, WALLMOUNT, of the output designation specified; LUMINAIRE, LED, UNDERPASS, SUSPENDED, of the output designation specified; LUMINAIRE, LED, SIGN LIGHTING, of the output designation specified.

When independent luminaire testing is required, the work will be paid for at the contract lump sum price for INDEPENDENT LUMINAIRE TESTING.”

Luminaires. Revise Articles 1067.01 through 1067.06 to read.

“1067.01 General. The luminaire shall be mechanically strong and easy to maintain. The size, weight, and shape of the luminaire shall be designed so as not to incite detrimental vibrations in its respective pole and it shall be compatible with the pole and arm. All electrical and electronic components of the luminaire shall comply with the requirements of Restriction of Hazardous Materials (RoHS) regulations. The luminaire shall be listed for wet locations by an NRTL and shall meet the requirements of UL 1598 and UL 8750.

- (a) Labels. An internal label shall be provided indicating the luminaire is suitable for wet locations and indicating the luminaire is an NRTL listed product to UL1598 and UL8750. The internal label shall also comply with the requirements of ANSI C136.22.

An external label consisting of two black characters on a white background with the dimensions of the label and the characters as specified in ANSI C136.15 for HPS luminaires. The first character shall be the alphabetical character representing the initial lumen output as specified in Table 1 of Article 1067.06(c). The second character shall be the numerical character representing the transverse light distribution type as specified in IES RP-8 (i.e. Types 1, 2, 3, 4, or 5).

- (b) Surge Protection. The luminaire shall comply the requirements of ANSI C136.2 for electrical transient immunity at the “Extreme” level (20KV/10KA) and shall be equipped with a surge protective device (SPD) that is UL1449 compliant with indicator light. An SPD failure shall open the circuit to protect the driver.

- (c) Optical Assembly. The optical assembly shall have an IP66 or higher rating in accordance with ANSI C136.25. The circuiting of the LED array shall be designed to minimize the effect of individual LED failures on the operation of other LEDs. All optical components shall be made of glass or a UV stabilized, non-yellowing material.
- (d) Housing. All external surfaces shall be cleaned in accordance with the manufacturer's recommendations and be constructed in such a way as to discourage the accumulation of water, ice, and debris.
- (e) Driver. The driver shall be integral to the luminaire and shall be capable of receiving indefinite open and short circuit output conditions without damage.

The driver shall incorporate the use of thermal foldback circuitry to reduce output current under abnormal driver case temperature conditions and shall be rated for a lifetime of 100,000 hours at an ambient temperature exposure of 77 °F (25 °C) to the luminaire. If the driver has a thermal shut down feature, it shall not turn off the LEDs when operated at 104 °F (40 °C) or less.

The driver shall have an input voltage range of 120 to 277 volts ($\pm 10\%$) or 347 to 480 volts ($\pm 10\%$) according to the contract documents. When the driver is operating within the rated input voltage range and in an un-dimmed state, the power factor measurement shall be not less than 0.9 and the THD measurement shall be no greater than 20%.

The driver shall meet the requirements of the FCC Rules and Regulations, Title 47, Part 15 for Class A devices with regard to electromagnetic compatibility. This shall be confirmed through the testing methods in accordance with ANSI C63.4 for electromagnetic interference.

The driver shall be dimmable using the protocol listed in the Luminaire Performance Table shown in the contract.

- (f) Photometric Performance. The luminaire shall be IES LM-79 tested by a laboratory holding accreditation from the NVLAP for IES LM-79 testing procedures. At a minimum the LM-79 report shall include a backlight/uplight/glare (BUG) rating and a luminaire classification system (LCS) graph showing lumen values and percent lumens by zone as described in IES RP-8. The uplight of the BUG rating shall be U=0.

The luminaire shall also meet the requirements of the Luminaire Performance Table shown in the contract.

- (g) Finish. The luminaire shall have a baked acrylic enamel finish. The color of the finish shall be gray, bronze, or black to match the pole or tower on which the luminaire is mounted.

The finish shall have a rating of six or greater according to ASTM D1654, Section 8.0 Procedure A – Evaluation of Rust Creepage for Scribed Samples after exposure to

1000 hours of testing according to ASTM B117 for painted or finished surfaces under environmental exposure.

The luminaire finish shall have less than or equal to 30% reduction of gloss according to ASTM D523 after exposure of 500 hours to ASTM G154 Cycle 6 QUV® accelerated weathering testing.

- (h) Hardware. All hardware shall be stainless steel or of other corrosion resistant material approved by the Engineer.

Luminaires shall be designed to be easily serviced, having fasteners such as quarter-turn clips of the heavy spring-loaded type with large, deep straight slot heads, complete with a receptacle and shall be according to military specification MIL-f-5591.

All hardware shall be captive and not susceptible to falling from the luminaire during maintenance operations. This shall include lens/lens frame fasteners as well hardware holding the removable driver and electronic components in place.

- (i) Vibration Testing. All luminaires shall be subjected to and pass vibration testing requirements at “3G” minimum zero to peak acceleration in accordance with ANSI C136.31 requirements using the same luminaire. To be accepted, the luminaire housing, hardware, and each individual component shall pass this test with no noticeable damage and the luminaire must remain fully operational after testing.
- (j) Wiring. All wiring in the luminaire shall be rated for operation at 600V, 221 °F (105 °C).
- (k) Independent Luminaire Testing. When a contract has 30 or more luminaires of the same manufacturer’s catalog number, that luminaire shall be independently tested to verify it will meet the contract requirements. The quantity of luminaires requiring testing shall be one luminaire for the first 30 plus one additional luminaire for each additional 50 luminaires of that catalog number. Testing is not required for temporary lighting luminaires.

Prior to testing the Contractor shall propose a properly accredited laboratory and a qualified independent witness, submitting their qualifications to the Engineer for approval. After approval, the Contractor shall coordinate the testing and pay all associated costs, including travel expenses, for the independent witness.

- (1) Independent Witness. The independent witness shall select from the project luminaires at the manufacturer’s facility the luminaires for testing. In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. The independent witness shall mark each sample luminaire’s shipping carton with the IDOT contract number and a unique sample identifier.

At the time of random selection, the independent witness shall inspect the luminaire(s) for compliance with all physical, mechanical, and labeling requirements for luminaires

according to Sections 821 and 1067. If deficiencies are found during the physical inspection, the Contractor shall have all luminaires of that manufacturer's catalog number inspected for the identified deficiencies and shall correct the problem(s) where found. Random luminaire selection and physical inspection must then be repeated. When the physical inspection is successfully completed, the independent witness shall mark the project number and sample identifier on the interior housing and driver of the luminaires and have them shipped to the laboratory.

The independent witness shall be present when testing is approved to be performed by the luminaire manufacturer. If the tests are performed by a laboratory independent of the luminaire manufacturer, distributor, and Contractor, the independent witness need not be present during the testing.

- (2) Laboratory Testing. Luminaires shall be tested at an NVLAP accredited laboratory approved for each of the required tests. The testing shall include photometric, colorimetric, and electrical testing according to IES LM-79. Colorimetric values shall be determined from total spectral radiant flux measurements using a spectroradiometer. Photometric testing shall be according to IES recommendations and as a minimum, shall yield an isofootcandle chart, with max candela point and half candela trace indicated, an isocandela diagram, maximum plane and maximum cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, BUG rating report, and complete calculations based on specified requirements and test results.

All testing shall cover the full spherical light output at a maximum of 5 degree intervals at the vertical angles. The vertical angles shall run from 0 to 180 degrees. There shall be a minimum of 40 lateral test planes listed in Fig. 1 of IES LM-31 plus the two planes containing the maximum candela on the left and right sides of the luminaire axis. Before testing, the luminaire when mounted on the goniometer shall be scanned for vertical and horizontal angles of maximum candela and these planes included in the test. The luminaire shall be checked for a bi-symmetric light distribution. Individual tests must be conducted for each hemisphere, quadrant, and left/right sides.

The results for each photometric and colorimetric test performed shall be presented in a standard IES LM-79 report that includes the contract number, sample identifier, and the outputs listed above. The calculated results for each sample luminaire shall meet or exceed the contract specified levels in the luminaire performance table(s). The laboratory shall mark its test identification number on the interior of each sample luminaire.

Electrical testing shall be in according to IES LM-79 as well as NEMA and ANSI standards. The report shall list luminaire characteristics including input amperes, watts, power factor, total harmonic distortion, and LED driver current for full and partial power.

- (3) Summary Test Report. The summary test report shall consist of a narrative documenting the test process, highlight any deficiencies and corrective actions, and clearly state which luminaires have met or exceeded the test requirements and may be released for delivery to the jobsite. Photographs shall also be used as applicable to document luminaire deficiencies and shall be included in the test report. The summary test report shall include the Luminaire Physical Inspection Checklist (form BDE 5650), photometric and electrical test reports, and point-by-point photometric calculations performed in AGi32 sorted by luminaire manufacturers catalog number. All test reports shall be certified by the independent test laboratory's authorized representative or the independent witness, as applicable, by a dated signature on the first page of each report. The summary test reports shall be delivered to the Engineer and the Contractor as an electronic submittal. Hard copy reports shall be delivered to the Engineer for record retention.
- (4) Approval of Independent Testing Results. Should any of the tested luminaires fail to satisfy the specifications and perform according to approved submittal information, all luminaires of that manufacturers catalog number shall be deemed unacceptable and shall be replaced by alternate equipment meeting the specifications. The submittal and testing process shall then be repeated in its entirety. The Contractor may request in writing that unacceptable luminaires be corrected in lieu of replacement. The request shall identify the corrections to be made and upon approval of the request, the Contractor shall apply the corrections to the entire lot of unacceptable luminaires. Once the corrections are completed, the testing process shall be repeated, including selection of a new set of sample luminaires. The number of luminaires to be tested shall be the same quantity as originally tested.

The process of retesting, correcting, or replacing luminaires shall be repeated until luminaires for each manufacturers catalog number are approved for the project. Corrections and re-testing shall not be grounds for additional compensation or extension of time. No luminaires shall be shipped from the manufacturer to the jobsite until all luminaire testing is completed and approved in writing.

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen independent witness and laboratory. All summary test reports, written reports, and the qualifications of the independent witness and laboratory shall be submitted for approval to the Engineer with a copy to the Bureau of Design and Environment, 2300 S Dirksen Parkway, Room 330 Springfield, IL 62764.

1067.02 Roadway Luminaires. Roadway luminaires shall be according to Article 1067.01 and the following.

The luminaire shall be horizontally mounted and shall be designed to slip-fit on a 2-3/8 in. (60 mm) outside diameter pipe arm with a stop to limit the amount of insertion to 7 in. (180 mm). It shall not be necessary to remove or open more than the access door to mount the luminaire.

The effective projected area (EPA) of the luminaire shall not exceed 1.6 sq ft (0.149 sq m) and the weight, including accessories, shall not exceed 40 lb (18.14 kg). If the weight of the luminaire is less than 20 lb (9.07 kg), weight shall be added to the mounting arm or a supplemental vibration damper installed as approved by the Engineer.

The luminaire shall be equipped with both internal and external leveling indicators. The external leveling indicator shall be clearly visible in daylight to an observer directly under the luminaire at a mounting height of 50 ft (15.2 m).

The luminaire shall be fully prewired to accept a seven-pin, twist-lock receptacle that is compliant with ANSI C136.41. All receptacle pins shall be connected according to TALQ Consortium protocol.

The luminaire shall be provided with an installed shorting cap that is compliant with ANSI C136.10.

1067.03 Highmast Luminaires. Highmast luminaires shall be according to Article 1067.01 and the following.

The luminaire shall be horizontally mounted and shall be designed and manufactured for highmast tower use. The EPA of the luminaire shall not exceed 3.0 sq ft (0.279 sq m) and the weight, including accessories, shall not exceed 85 lb (38.6 kg).

The optical assembly shall be capable of being rotated 360 degrees. A vernier scale shall be furnished on the axis of rotation for aiming the luminaire in relation to its mounting tenon arm. The scale shall be graduated in 5 degree increments or less. The luminaire shall be clearly marked at the vernier as to 'house-side' and 'street-side' to allow proper luminaire orientation.

1067.04 Underpass Luminaires. Underpass luminaries shall be according to Article 1067.01 and the following.

The underpass luminaire shall be complete with all supports, hardware, and appurtenant mounting accessories. The underpass luminaire shall be suitable for lighting a roadway underpass at an approximate mounting height of 15 ft (4.5 m) from a position suspended directly above the roadway edge of pavement or attached to a wall or pier. The underpass luminaire shall meet the requirements of ANSI C136.27.

It shall not be necessary to remove more than the cover, reflector and lens to mount the luminaire. The unit shall be heavy duty, suitable for highway use and shall have no indentations or crevices in which dirt, salt, or other corrosives may collect.

- (a) Housing. The housing and lens frame shall be made of heavy duty die cast aluminum or 16 gauge (1.5 mm) minimum thickness Type 304 stainless steel. All seams in the housing enclosure shall be welded by continuous welds.

The housing shall have an opening for installation of a 3/4 in. (19 mm) diameter conduit.

(b) Lens and Lens Frame. The frame shall not overlap the housing when closed. The luminaire shall have a flat glass lens to protect the LEDs from dirt accumulation or be designed to prevent dirt accumulation. The optic assembly shall be rated IP 66 or higher.

1067.05 Sign Lighting Luminaires. Sign lighting luminaires shall be suitable for lighting overhead freeway and expressway guide signs; and shall be according to Article 1067.01.

1067.06 Light Sources. The light sources in all luminaires shall be LED according to Article 1067.01 and the following.

- (a) The light source shall be according to ANSI C136.37 for solid state light sources used in roadway and area lighting.
- (b) The light source shall have a minimum color rendering index (CRI) of 70 and a nominal correlated color temperature (CCT) of 4000 K.
- (c) The rated initial luminous flux (lumen output) of the light source, as installed in the luminaire, shall be according to the following table for each specified output designation.

Output Designations and Initial Luminous Flux		<i>(for information only)</i>
Output Designation	Initial Luminous Flux (lm)	Approximate High Pressure Sodium (HPS) Equivalent Wattage
A	2,200	35 (Low Output)
B	3,150	50 (Low Output)
C	4,400	70 (Low Output)
D	6,300	100 (Low Output)
E	9,450	150 (Low Output)
F	12,500	200 (Med Output)
G	15,500	250 (Med Output)
H	25,200	400 (Med Output)
I	47,250	750 (High Output)
J	63,300	1,000 (High Output)
K	80,000+	1,000+ (High Output)

Luminaires with an initial luminous flux less than the values listed in the above table may be acceptable if they meet the requirements given in the Luminaire Performance Table shown in the contract.”

MANHOLES, VALVE VAULTS, AND FLAT SLAB TOPS (BDE)

Effective: January 1, 2018

Revised: March 1, 2019

Description. In addition to those manufactured according to the current standards included in this contract, manholes, valve vaults, and flat slab tops manufactured prior to March 1, 2019, according to the previous Highway Standards listed below will be accepted on this contract:

Product	Previous Standards		
Precast Manhole Type A, 4' (1.22 m) Diameter	602401-05	602401-04	602401-03
Precast Manhole Type A, 5' (1.52 m) Diameter	602402-01	602402	602401-03
Precast Manhole Type A, 6' (1.83 m) Diameter	602406-09	602406-08	602406-07
Precast Manhole Type A, 7' (2.13 m) Diameter	602411-07	602411-06	602411-05
Precast Manhole Type A, 8' (2.44 m) Diameter	602416-07	602416-06	602416-05
Precast Manhole Type A, 9' (2.74 m) Diameter	602421-07	602421-06	602421-05
Precast Manhole Type A, 10' (3.05 m) Diameter	602426-01	602426	
Precast Valve Vault Type A, 4' (1.22 m) Diameter	602501-04	602501-03	602501-02
Precast Valve Vault Type A, 5' (1.52 m) Diameter	602506-01	602506	602501-02
Precast Reinforced Concrete Flat Slab Top	602601-05	602601-04	

The following revisions to the Standard Specifications shall apply to manholes, valve vaults, and flat slab tops manufactured according to the current standards included in this contract:

Revise Article 602.02(g) of the Standard Specifications to read:

“(g) Structural Steel (Note 4) 1006.04

Note 4. All components of the manhole joint splice shall be galvanized according to the requirements of AASHTO M 111 or M 232 as applicable.”

Add the following to Article 602.02 of the Standard Specifications:

“(s) Anchor Bolts and Rods (Note 5) 1006.09

Note 5. The threaded rods for the manhole joint splice shall be according to the requirements of ASTM F 1554, Grade 55, (Grade 380).”

Revise the second paragraph of Article 1042.10 of the Standard Specifications to read:

“Catch basin Types A, B, C, and D; Manhole Type A; Inlet Types A and B; Drainage Structures Types 1, 2, 3, 4, 5, and 6; Valve Vault Type A; and reinforced concrete flat slab top (Highway Standard 602601) shall be manufactured according to AASHTO M 199 (M 199M), except the minimum wall thickness shall be as shown on the plans. Additionally, catch basins, inlets, and drainage structures shall have a minimum concrete compressive strength of 4500 psi

(31,000 kPa) at 28 days and manholes, valve vaults, and reinforced concrete flat slab tops shall have a minimum concrete compressive strength of 5000 psi (34,500 kPa) at 28 days.”

80393

MOBILIZATION (BDE)

Effective: April 1, 2020

Replace Articles 671.02(a), (b), and (c) of the Standard Specifications with the following:

“(a) Upon execution of the contract, 90 percent of the pay item will be paid.

(b) When 90 percent of the adjusted contract value is earned, the remaining ten percent of the pay item will be paid along with any amount bid in excess of six percent of the original contract amount.”

80428

PORTLAND CEMENT CONCRETE – HAUL TIME (BDE)

Effective: July 1, 2020

Revise Article 1020.11(a)(7) of the Standard Specifications to read:

“(7) Haul Time. Haul time shall begin when the delivery ticket is stamped. The delivery ticket shall be stamped no later than five minutes after the addition of the mixing water to the cement, or after the addition of the cement to the aggregate when the combined aggregates contain free moisture in excess of two percent by weight (mass). If more than one batch is required for charging a truck using a stationary mixer, the time of haul shall start with mixing of the first batch. Haul time shall end when the truck is emptied for incorporation of the concrete into the work. The maximum haul time shall be as follows.

Concrete Temperature at Point of Discharge, °F (°C)	Maximum Haul Time ^{1/} (minutes)	
	Truck Mixer or Truck Agitator	Nonagitator Truck
50 - 64 (10 - 17.5)	90	45
> 64 (> 17.5) - without retarder	60	30
> 64 (> 17.5) - with retarder	90	45

1/ To encourage start-up testing for mix adjustments at the plant, the first two trucks will be allowed an additional 15 minutes haul time whenever such testing is performed.

For a mixture which is not mixed on the jobsite, a delivery ticket shall be required for each load. The following information shall be recorded on each delivery ticket: (1) ticket number; (2) name of producer and plant location; (3) contract number; (4) name of Contractor; (5) stamped date and time batched; (6) truck number; (7) quantity batched; (8) amount of admixture(s) in the batch; (9) amount of water in the batch; and (10) Department mix design number.

For concrete mixed in jobsite stationary mixers, the above delivery ticket may be waived, but a method of verifying the haul time shall be established to the satisfaction of the Engineer.”

80430

PORTLAND CEMENT CONCRETE BRIDGE DECK CURING (BDE)

Effective: April 1, 2015

Revised: November 1, 2019

Revise the following three entries and add the following footnote to the Index Table of Curing and Protection of Concrete Construction in Article 1020.13 of the Standard Specifications:

"INDEX TABLE OF CURING AND PROTECTION OF CONCRETE CONSTRUCTION"			
TYPE OF CONSTRUCTION	CURING METHODS	CURING PERIOD DAYS	LOW AIR TEMPERATURE PROTECTION METHODS
Superstructure (except deck)	1020.13(a)(1)(2)(3)(5)(6) ^{8/ 19/}	7	1020.13(d)(1)(2)
Superstructure (Approach Slab)	1020.13(a)(5)(6) ^{19/}	3	1020.13(d)(1)(2) ^{17/}
Deck	1020.13(a)(5)(6) ^{19/}	7	1020.13(d)(1)(2) ^{17/}

19/ The cellulose polyethylene or synthetic fiber with polymer polyethylene blanket method shall not be used on latex modified concrete, or vertical concrete surfaces greater than 1 ft (300 mm), e.g. parapets."

Add the following to Article 1020.13(a) of the Standard Specifications.

"(6)Cellulose Polyethylene Blanket Method and Synthetic Fiber with Polymer Polyethylene Blanket Method. After the surface of concrete has been textured or finished, it shall be covered immediately with a wetted cellulose polyethylene blanket or wetted synthetic fiber with polymer polyethylene blanket. The blankets shall be installed with the white perforated polyethylene side facing up. The blanket's fiber side shall be wetted immediately prior to placement or as the blanket is being placed, and the polyethylene side shall be thoroughly soaked with a gentle spray of water immediately after placement. For bridge decks, a foot bridge shall be used to place and wet the blankets.

Adjoining blankets shall overlap a minimum of 8 in. (200 mm). Bubbles and wrinkles shall be removed with a broom, squeegee, or as recommended by the manufacturer.

The blankets shall be maintained in a wetted condition until the concrete has hardened sufficiently to place soaker hoses without indentations to the concrete surface. The soaker hoses shall be placed on top of the blankets at a maximum 4 ft (1.2 m) spacing. The blankets shall be kept wet with a continuous supply of water for the remainder of the curing period. Other continuous wetting systems may be used if approved by the Engineer.

For areas inaccessible to the blankets, curing shall be according to Article 1020.13(a)(3). "

Revise the first paragraph of Article 1022.03 of the Standard Specifications to read:

“1022.03 Waterproof Paper Blankets, White Polyethylene Sheeting, Burlap-Polyethylene Blankets, Cellulose Polyethylene Blankets, and Synthetic Fiber with Polymer Polyethylene Blankets. These materials shall be white and according to ASTM C 171.

The cellulose polyethylene blanket shall consist of a perforated white polyethylene sheeting with cellulose fiber backing and shall be limited to single use only. The cellulose polyethylene blankets shall be delivered to the jobsite unused and in the manufacturer's unopened packaging until ready for installation. Each roll shall be clearly labeled on the product with product name, manufacturer, and manufacturer's certification of compliance with ASTM C 171.

The synthetic fiber with polymer polyethylene blanket shall consist of a perforated white polyethylene sheeting with absorbent synthetic fibers and super absorbent polymer backing, and shall be limited to single use only. The synthetic fiber with polymer polyethylene blankets shall be delivered to the jobsite unused and in the manufacturer's unopened packaging until ready for installation. Each roll shall be clearly labeled on the product with product name, manufacturer, and manufacturer's certification of compliance with ASTM C 171.”

80359

PORTLAND CEMENT CONCRETE PAVEMENT PATCHING (BDE)

Effective: July 1, 2020

Revise Article 701.17(e)(3)b. of the Standard Specifications to read:

- “b. Strength Tests. For patches constructed with Class PP-1, PP-2, PP-3, PP-4, or PP-5 concrete, the pavement may be opened to traffic when test specimens have obtained a minimum flexural strength of 250 psi (1725 kPa) or a minimum compressive strength of 1600 psi (11,000 kPa) according to Article 1020.09. However, the concrete mixture shall obtain a minimum flexural strength of 600 psi (4150 kPa) or a minimum compressive strength of 3200 psi (22,100 kPa) in the time specified in Table 1 of Article 1020.04.

With the approval of the Engineer, concrete strength may be determined according to Illinois Modified AASHTO T 325.”

Revise Article 1001.01(d) of the Standard Specifications to read:

“(d) Rapid Hardening Cement. Rapid hardening cement shall be used according to Article 1020.04 or when approved by the Engineer. The cement shall be on the Department’s qualified product list, and shall be according to ASTM C 1600 in addition to the following.

- (1) The cement shall have a minimum final set of 10 minutes, according to Illinois Modified AASHTO T 131.
- (2) The cement shall have a minimum compressive strength of 2000 psi (13,800 kPa) at 3.0 hours, 3200 psi (22,100 kPa) at 6.0 hours, and 4000 psi (27,600 kPa) at 24.0 hours, according to Illinois Modified AASHTO T 106.
- (3) The cement shall have a maximum drying shrinkage of 0.07 percent at 28 days, according to Illinois Modified ASTM C 596.
- (4) The cement shall have a maximum expansion of 0.04 percent at 14 days, according to Illinois Modified ASTM C 1038.”

Revise the first paragraph of Article 1020.05(b)(5) of the Standard Specifications to read:

“(5) For Class PP-4 concrete, a high range water-reducing admixture shall be used in addition to the air-entraining admixture. The Contractor has the option to use a water-reducing admixture with the high range water-reducing admixture. An accelerator shall not be used. A mobile portland cement concrete plant shall be used to produce the patching mixture.”

80431

PORTLAND CEMENT CONCRETE PAVEMENT PLACEMENT (BDE)

Effective: July 1, 2020

Revise the fifth paragraph of Article 420.07 of the Standard Specifications to read:

“The concrete shall be deposited uniformly across the subgrade or subbase as close as possible to its final position. The time elapsing from when the concrete is unloaded until it is incorporated into the work shall not exceed 20 minutes. When required, hand spreading shall be accomplished with shovels.”

80432

RAILROAD PROTECTIVE LIABILITY INSURANCE (5 and 10) (BDE)

Effective: January 1, 2006

Description. Railroad Protective Liability and Property Damage Liability Insurance shall be carried according to Article 107.11 of the Standard Specifications, except the limits shall be a minimum of \$5,000,000 combined single limit per occurrence for bodily injury liability and property damage liability with an aggregate limit of \$10,000,000 over the life of the policy. A separate policy is required for each railroad unless otherwise noted.

NAMED INSURED & ADDRESS	NUMBER & SPEED OF PASSENGER TRAINS	NUMBER & SPEED OF FREIGHT TRAINS
Norfolk Southern Railway Co. Three Commercial Place Norfolk, Va 25310-2191	None	16 Trains/Day 60 mph
DOT/AAR No.: 479337E and 479336X RR Division: Western	RR Mile Post:DH-415.24 and DH-414.71 RR Sub-Division: Decatur	
For Freight/Passenger Information Contact:Scott Overbey For Insurance Information Contact: Scott Dickerson		Phone: (404) 582-5588 Phone: (757) 629-2364

DOT/AAR No.:	RR Mile Post:	
RR Division:	RR Sub-Division:	
For Freight/Passenger Information Contact:		Phone:
For Insurance Information Contact:		Phone:

Approval of Insurance. The original and one certified copy of each required policy shall be submitted to the following address for approval:

Illinois Department of Transportation
Bureau of Design and Environment
2300 South Dirksen Parkway, Room 326
Springfield, Illinois 62764

The Contractor will be advised when the Department has received approval of the insurance from the railroad(s). Before any work begins on railroad right-of-way, the Contractor shall submit to the Engineer evidence that the required insurance has been approved by the railroad(s). The Contractor shall also provide the Engineer with the expiration date of each required policy.

Basis of Payment. Providing Railroad Protective Liability and Property Damage Liability Insurance will be paid for at the contract unit price per Lump Sum for RAILROAD PROTECTIVE LIABILITY INSURANCE.

80157

RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES (BDE)

Effective: November 1, 2012

Revised: January 2, 2021

Revise Section 1031 of the Standard Specifications to read:

“SECTION 1031. RECLAIMED ASPHALT PAVEMENT AND RECLAIMED ASPHALT SHINGLES

1031.01 Description. Reclaimed asphalt pavement and reclaimed asphalt shingles shall be according to the following.

- (a) Reclaimed Asphalt Pavement (RAP). RAP is the material produced by cold milling or crushing an existing hot-mix asphalt (HMA) pavement. The Contractor shall supply written documentation that the RAP originated from routes or airfields under federal, state, or local agency jurisdiction.
- (b) Reclaimed Asphalt Shingles (RAS). RAS is the material produced from the processing and grinding of preconsumer or post-consumer shingles. RAS shall be a clean and uniform material with a maximum of 0.5 percent unacceptable material by weight of RAS, as defined in the Bureau of Materials Policy Memorandum, “Reclaimed Asphalt Shingle (RAS) Sources”. RAS shall come from a facility source on the Department’s “Qualified Producer List of Certified Sources for Reclaimed Asphalt Shingles” where it shall be ground and processed to 100 percent passing the 3/8 in. (9.5 mm) sieve and 93 percent passing the #4 (4.75 mm) sieve based on a dry shake gradation. RAS shall be uniform in gradation and asphalt binder content and shall meet the testing requirements specified herein. In addition, RAS shall meet the following Type 1 or Type 2 requirements.
 - (1) Type 1. Type 1 RAS shall be processed, preconsumer asphalt shingles salvaged from the manufacture of residential asphalt roofing shingles.
 - (2) Type 2. Type 2 RAS shall be processed post-consumer shingles only, salvaged from residential, or four unit or less dwellings not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP).

1031.02 Stockpiles. RAP and RAS stockpiles shall be according to the following.

- (a) RAP Stockpiles. The Contractor shall construct individual RAP stockpiles meeting one of the following definitions. Stockpiles shall be sufficiently separated to prevent intermingling at the base. Stockpiles shall be identified by signs indicating the type as listed below (i.e. “Homogeneous Surface”).

Prior to milling, the Contractor shall request the Department provide documentation on the quality of the RAP to clarify the appropriate stockpile.

- (1) Fractionated RAP (FRAP). FRAP shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures. The coarse aggregate in FRAP shall be crushed aggregate and may represent more than one aggregate type and/or quality but shall be at least C quality. FRAP shall be fractionated prior to testing by screening into a minimum of two size fractions with the separation occurring on or between the No. 4 (4.75 mm) and 1/2 in. (12.5 mm) sieves. Agglomerations shall be minimized such that 100 percent of the RAP in the coarse fraction shall pass the maximum sieve size specified for the mixture composition of the mix design.
- (2) Homogeneous. Homogeneous RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures and represent: 1) the same aggregate quality, but shall be at least C quality; 2) the same type of crushed aggregate (either crushed natural aggregate, ACBF slag, or steel slag); 3) similar gradation; and 4) similar asphalt binder content. If approved by the Engineer, combined single pass surface/binder millings may be considered "homogeneous" with a quality rating dictated by the lowest coarse aggregate quality present in the mixture.
- (3) Conglomerate. Conglomerate RAP stockpiles shall consist of RAP from Class I, HMA (High and Low ESAL) mixtures. The coarse aggregate in this RAP shall be crushed aggregate and may represent more than one aggregate type and/or quality but shall be at least C quality. This RAP may have an inconsistent gradation and/or asphalt binder content prior to processing. Conglomerate RAP shall be processed prior to testing by crushing to where all RAP shall pass the 5/8 in. (16 mm) or smaller screen. Conglomerate RAP stockpiles shall not contain steel slag.
- (4) Conglomerate "D" Quality (Conglomerate DQ). Conglomerate DQ RAP stockpiles shall be according to Articles 1031.02(a)(1)-1031.02(a)(3), except they may also consist of RAP from HMA shoulders, bituminous stabilized subbases, or HMA (High or Low ESAL) binder mixture. The coarse aggregate in this RAP may be crushed or round but shall be at least D quality. This RAP may have an inconsistent gradation and/or asphalt binder content.
- (5) Non-Quality. RAP stockpiles that do not meet the requirements of the stockpile categories listed above shall be classified as "Non-Quality".

RAP/FRAP containing contaminants, such as earth, brick, sand, concrete, sheet asphalt, non-bituminous surface treatment (i.e. high friction surface treatments), pavement fabric, joint sealants, plant cleanout, etc., will be unacceptable unless the contaminants are removed to the satisfaction of the Engineer. Sheet asphalt shall be stockpiled separately.

- (b) RAS Stockpiles. Type 1 and Type 2 RAS shall be stockpiled separately and shall not be intermingled. Each stockpile shall be signed indicating what type of RAS is present.

Unless otherwise specified by the Engineer, mechanically blending manufactured sand (FM 20 or FM 22) or fine FRAP up to an equal weight of RAS with the processed RAS will be permitted to improve workability. The sand shall be B quality or better from an

approved Aggregate Gradation Control System source. The sand shall be accounted for in the mix design and during HMA production.

Records identifying the shingle processing facility supplying the RAS, RAS type, and lot number shall be maintained by project contract number and kept for a minimum of three years.

Additional processed RAP/FRAP/RAS shall be stockpiled in a separate working pile, as designated in the QC Plan, and only added to the original stockpile after the test results for the working pile are found to meet the requirements specified in Articles 1031.03 and 1031.04.

1031.03 Testing. RAP/FRAP and RAS testing shall be according to the following.

(a) RAP/FRAP Testing. When used in HMA, the RAP/FRAP shall be sampled and tested either during or after stockpiling.

(1) During Stockpiling. For testing during stockpiling, washed extraction samples shall be run at the minimum frequency of one sample per 500 tons (450 metric tons) for the first 2,000 tons (1,800 metric tons) and one sample per 2,000 tons (1,800 metric tons) thereafter. A minimum of five tests shall be required for stockpiles less than 4,000 tons (3,600 metric tons).

(2) After Stockpiling. For testing after stockpiling, the Contractor shall submit a plan for approval to the Department proposing a satisfactory method of sampling and testing the RAP/FRAP pile either in-situ or by restockpiling. The sampling plan shall meet the minimum frequency required above and detail the procedure used to obtain representative samples throughout the pile for testing.

Each sample shall be split to obtain two equal samples of test sample size. One of the two test samples from the final split shall be labeled and stored for Department use. The Contractor shall perform a washed extraction on the other test sample according to Illinois Modified AASHTO T 164. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

(b) RAS Testing. RAS or RAS blended with manufactured sand shall be sampled and tested during stockpiling according to the Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Shingle (RAS) Source".

Samples shall be collected during stockpiling at the minimum frequency of one sample per 200 tons (180 metric tons) for the first 1,000 tons (900 metric tons) and one sample per 500 tons (450 metric tons) or a minimum of once per week, whichever is more frequent, thereafter. A minimum of five samples are required for stockpiles less than 1,000 tons (900 metric tons).

Before testing, each sample shall be split to obtain two test samples. One of the two test samples from the final split shall be labeled and stored for Department use. The

Contractor shall perform a washed extraction and test for unacceptable materials on the other test sample according to Illinois Modified AASHTO T 164. The Engineer reserves the right to test any sample (split or Department-taken) to verify Contractor test results.

The Contractor shall obtain and make available all of the test results from the start of the original stockpile.

1031.04 Evaluation of Tests. Evaluation of test results shall be according to the following.

- (a) Limits of Precision. The limits of precision between the Contractor's and the Department's split sample test results shall be according to the following.

Test Parameter	Limits of Precision		
	RAP	FRAP	RAS
% Passing			
1/2 in. (12.5 mm)	6.0 %	5.0 %	
# 4 (4.75 mm)	6.0 %	5.0 %	
# 8 (2.36 mm)	4.0 %	3.0 %	4.0 %
# 30 (600 μm)	3.0 %	2.0 %	4.0 %
# 200 (75 μm)	2.5 %	2.2 %	4.0 %
Asphalt Binder	0.4 %	0.3 %	3.0 %
G _{mm}	0.035	0.030	

If the test results are outside the above limits of precision, the Department will immediately investigate.

- (b) Evaluation of RAP/FRAP Test Results. All of the extraction results shall be compiled and averaged for asphalt binder content and gradation, and when applicable G_{mm}. Individual extraction test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	FRAP/Homogeneous/ Conglomerate
1 in. (25 mm)	
1/2 in. (12.5 mm)	± 8 %
# 4 (4.75 mm)	± 6 %
# 8 (2.36 mm)	± 5 %
# 16 (1.18 mm)	
# 30 (600 μm)	± 5 %
# 200 (75 μm)	± 2.0 %
Asphalt Binder	± 0.4 % ^{1/}
G _{mm}	± 0.03 ^{2/}

1/ The tolerance for FRAP shall be ± 0.3 percent.

- 2/ For stockpile with slag or steel slag present as determined in the current Manual of Test Procedures Appendix B 21, "Determination of Aggregate Bulk (Dry) Specific Gravity (Gsb) of Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)".

If more than 20 percent of the test results for an individual parameter (individual sieves, G_{mm} , and/or asphalt binder content) are out of the above tolerances, the RAP/FRAP shall not be used in HMA unless the RAP/FRAP representing the failing tests is removed from the stockpile. All test data and acceptance ranges shall be sent to the Department for evaluation.

With the approval of the Engineer, the ignition oven may be substituted for solvent extractions according to the document "Calibration of the Ignition Oven for the Purpose of Characterizing Reclaimed Asphalt Pavement (RAP)".

- (c) Evaluation of RAS and RAS Blended with Manufactured Sand or Fine FRAP Test Results. All of the test results, with the exception of percent unacceptable materials, shall be compiled and averaged for asphalt binder content and gradation. Individual test results, when compared to the averages, will be accepted if within the tolerances listed below.

Parameter	RAS
# 8 (2.36 mm)	± 5 %
# 16 (1.18 mm)	± 5 %
# 30 (600 μm)	± 4 %
# 200 (75 μm)	± 2.5 %
Asphalt Binder Content	± 2.0 %

If more than 20 percent of the test results for an individual parameter (individual sieves and/or asphalt binder content) are out of the above tolerances, or if the unacceptable material exceeds 0.5 percent by weight of material retained on the No. 4 (4.75 mm) sieve, the RAS or RAS blend shall not be used in Department projects. All test data and acceptance ranges shall be sent to the Department for evaluation.

1031.05 Quality Designation of Aggregate in RAP/FRAP.

- (a) RAP. The aggregate quality of the RAP for homogeneous, conglomerate, and conglomerate DQ stockpiles shall be set by the lowest quality of coarse aggregate in the RAP stockpile and are designated as follows.
- (1) RAP from Class I, HMA (High ESAL), or (Low ESAL) IL-9.5L surface mixtures are designated as containing Class B quality coarse aggregate.
 - (2) RAP from Class I binder, HMA (High ESAL) binder, or (Low ESAL) IL-19.0L binder mixtures are designated as containing Class C quality coarse aggregate.

(3) RAP from BAM stabilized subbase and BAM shoulders are designated as containing Class D quality coarse aggregate.

(b) FRAP. If the Engineer has documentation of the quality of the FRAP aggregate, the Contractor shall use the assigned quality provided by the Engineer.

If the quality is not known, the quality shall be determined as follows. Coarse and fine FRAP stockpiles containing plus No. 4 (4.75 mm) sieve coarse aggregate shall have a maximum tonnage of 5,000 tons (4,500 metric tons). The Contractor shall obtain a representative sample witnessed by the Engineer. The sample shall be a minimum of 50 lb (25 kg). The sample shall be extracted according to Illinois Modified AASHTO T 164 by a consultant laboratory prequalified by the Department for the specified testing. The consultant laboratory shall submit the test results along with the recovered aggregate sample to the District Office. Consultant laboratory services will be at no additional cost to the Department. The District will forward the sample to the Central Bureau of Materials Aggregate Lab for MicroDeval Testing, according to ITP 327. A maximum loss of 15.0 percent will be applied for all HMA applications.

1031.06 Use of RAP/FRAP and/or RAS in HMA. The use of RAP/FRAP and/or RAS shall be the Contractor's option when constructing HMA in all contracts.

(a) RAP/FRAP. The use of RAP/FRAP in HMA shall be as follows.

(1) Coarse Aggregate Size. The coarse aggregate in all RAP shall be equal to or less than the nominal maximum size requirement for the HMA mixture to be produced.

(2) Steel Slag Stockpiles. Homogeneous RAP stockpiles containing steel slag will be approved for use in all HMA (High ESAL and Low ESAL) surface and binder mixture applications.

(3) Use in HMA Surface Mixtures (High and Low ESAL). RAP/FRAP stockpiles for use in HMA surface mixtures (High and Low ESAL) shall be FRAP or homogeneous in which the coarse aggregate is Class B quality or better. FRAP from conglomerate stockpiles shall be considered equivalent to limestone for frictional considerations. Known frictional contributions from plus No. 4 (4.75 mm) homogeneous FRAP stockpiles will be accounted for in meeting frictional requirements in the specified mixture.

(4) Use in HMA Binder Mixtures (High and Low ESAL), HMA Base Course, and HMA Base Course Widening. RAP/FRAP stockpiles for use in HMA binder mixtures (High and Low ESAL), HMA base course, and HMA base course widening shall be FRAP, homogeneous, or conglomerate, in which the coarse aggregate is Class C quality or better.

(5) Use in Shoulders and Subbase. RAP/FRAP stockpiles for use in HMA shoulders and stabilized subbase (HMA) shall be FRAP, homogeneous, or conglomerate.

- (6) When the Contractor chooses the RAP option, the percentage of RAP shall not exceed the amounts indicated in Article 1031.06(c)(1) below for a given Ndesign.
- (b) RAS. RAS meeting Type 1 or Type 2 requirements will be permitted in all HMA applications as specified herein.
- (c) RAP/FRAP and/or RAS Usage Limits. Type 1 or Type 2 RAS may be used alone or in conjunction with RAP or FRAP in HMA mixtures up to a maximum of 5.0 percent by weight of the total mix.
- (1) RAP/RAS. When RAP is used alone or RAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement (ABR) shall not exceed the amounts listed in the following table.

HMA Mixtures - RAP/RAS Maximum ABR % ^{1/2/}			
Ndesign	Binder	Surface	Polymer Modified Binder or Surface
30	30	30	10
50	25	15	10
70	15	10	10
90	10	10	10

1/ For Low ESAL HMA shoulder and stabilized subbase, the RAP/RAS ABR shall not exceed 50 percent of the mixture.

2/ When RAP/RAS ABR exceeds 20 percent, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

- (2) FRAP/RAS. When FRAP is used alone or FRAP is used in conjunction with RAS, the percentage of virgin asphalt binder replacement shall not exceed the amounts listed in the following table.

HMA Mixtures - FRAP/RAS Maximum ABR % ^{1/2/}			
Ndesign	Binder	Surface	Polymer Modified Binder or Surface
30	55	45	15
50	45	40	15
70	45	35	15
90	45	35	15
SMA	--	--	25

IL-4.75	--	--	35
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- 1/ For Low ESAL HMA shoulder and stabilized subbase, the FRAP/RAS ABR shall not exceed 50 percent of the mixture.
- 2/ When FRAP/RAS ABR exceeds 20 percent for all mixes, the high and low virgin asphalt binder grades shall each be reduced by one grade (i.e. 25 percent ABR would require a virgin asphalt binder grade of PG 64-22 to be reduced to a PG 58-28).

1031.07 HMA Mix Designs. At the Contractor's option, HMA mixtures may be constructed utilizing RAP/FRAP and/or RAS material meeting the detailed requirements specified herein.

- (a) RAP/FRAP and/or RAS. RAP/FRAP and/or RAS mix designs shall be submitted for verification. If additional RAP/FRAP and/or RAS stockpiles are tested and found that no more than 20 percent of the individual parameter test results, as defined in Article 1031.04, are outside of the control tolerances set for the original RAP/FRAP and/or RAS stockpile and HMA mix design, and meets all of the requirements herein, the additional RAP/FRAP and/or RAS stockpiles may be used in the original mix design at the percent previously verified.
- (b) RAS. Type 1 and Type 2 RAS are not interchangeable in a mix design.

The RAP, FRAP, and RAS stone bulk specific gravities (G_{sb}) shall be according to the "Determination of Aggregate Bulk (Dry) Specific Gravity (G_{sb}) of Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS)" procedure in the Department's Manual of Test Procedures for Materials.

1031.08 HMA Production. HMA production utilizing RAP/FRAP and/or RAS shall be as follows.

To remove or reduce agglomerated material, a scalping screen, gator, crushing unit, or comparable sizing device approved by the Engineer shall be used in the RAP/FRAP and/or RAS feed system to remove or reduce oversized material.

If the RAP/FRAP and/or RAS control tolerances or QC/QA test results require corrective action, the Contractor shall cease production of the mixture containing RAP/FRAP and/or RAS and either switch to the virgin aggregate design or submit a new mix design.

- (a) RAP/FRAP. The coarse aggregate in all RAP/FRAP used shall be equal to or less than the nominal maximum size requirement for the HMA mixture being produced.
- (b) RAS. RAS shall be incorporated into the HMA mixture either by a separate weight depletion system or by using the RAP weigh belt. Either feed system shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes. The portion of RAS shall be controlled accurately to within

± 0.5 percent of the amount of RAS utilized. When using the weight depletion system, flow indicators or sensing devices shall be provided and interlocked with the plant controls such that the mixture production is halted when RAS flow is interrupted.

(c) RAP/FRAP and/or RAS. HMA plants utilizing RAP/FRAP and/or RAS shall be capable of automatically recording and printing the following information.

(1) Dryer Drum Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.
- c. Accumulated weight of dry aggregate (combined or individual) in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).
- d. Accumulated dry weight of RAP/FRAP/RAS in tons (metric tons) to the nearest 0.1 ton (0.1 metric ton).
- e. Accumulated mineral filler in revolutions, tons (metric tons), etc. to the nearest 0.1 unit.
- f. Accumulated asphalt binder in gallons (liters), tons (metric tons), etc. to the nearest 0.1 unit.
- g. Residual asphalt binder in the RAP/FRAP/RAS material as a percent of the total mix to the nearest 0.1 percent.
- h. Aggregate and RAP/FRAP/RAS moisture compensators in percent as set on the control panel. (Required when accumulated or individual aggregate and RAP/FRAP/RAS are recorded in a wet condition.)
- i. A positive dust control system shall be utilized when the combined contribution of reclaimed material passing the No. 200 sieve exceeds 1.5 percent.

(2) Batch Plants.

- a. Date, month, year, and time to the nearest minute for each print.
- b. HMA mix number assigned by the Department.
- c. Individual virgin aggregate hot bin batch weights to the nearest pound (kilogram).
- d. Mineral filler weight to the nearest pound (kilogram).
- e. RAP/FRAP/RAS weight to the nearest pound (kilogram).

- f. Virgin asphalt binder weight to the nearest pound (kilogram).
- g. Residual asphalt binder in the RAP/FRAP/RAS material as a percent of the total mix to the nearest 0.1 percent.

The printouts shall be maintained in a file at the plant for a minimum of one year or as directed by the Engineer and shall be made available upon request. The printing system will be inspected by the Engineer prior to production and verified at the beginning of each construction season thereafter.

1031.09 RAP in Aggregate Applications. RAP in aggregate applications shall be according to the Bureau of Materials Policy Memorandum, "Reclaimed Asphalt Pavement (RAP) for Aggregate Applications" and the following.

- (a) RAP in Aggregate Surface Course and Aggregate Wedge Shoulders, Type B. The use of RAP in aggregate surface course (temporary access entrances only) and aggregate wedge shoulders, Type B shall be as follows.
 - (1) Stockpiles and Testing. RAP stockpiles may be any of those listed in Article 1031.02, except "Non-Quality" and "FRAP". The testing requirements of Article 1031.03 shall not apply.
 - (2) Gradation. One hundred percent of the RAP material shall pass the 1 1/2 in. (37.5 mm) sieve. The RAP material shall be reasonably well graded from coarse to fine. RAP material that is gap-graded or single sized will not be accepted.
- (b) RAP in Aggregate Subgrade Improvement (ASI). RAP in ASI shall be according to Article 1031.06, except "Conglomerate DQ" and "Non-Quality" may be used."

80306

REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES (BDE)

Effective: January 1, 2019

Revised: January 1, 2020

Revise Section 669 of the Standard Specifications to read:

“SECTION 669. REMOVAL AND DISPOSAL OF REGULATED SUBSTANCES

669.01 Description. This work shall consist of the transportation and proper disposal of regulated substances. This work shall also consist of the removal, transportation, and proper disposal of underground storage tanks (UST), their contents and associated underground piping to the point where the piping is above the ground, including determining the content types and estimated quantities.

669.02 Equipment. The Contractor shall notify the Engineer of the delivery of all excavation, storage, and transportation equipment to a work area location. The equipment shall comply with OSHA and American Petroleum Institute (API) guidelines and shall be furnished in a clean condition. Clean condition means the equipment does not contain any residual material classified as a non-special waste, non-hazardous special waste, or hazardous waste. Residual materials include, but are not limited to, petroleum products, chemical products, sludges, or any other material present in or on equipment.

Before beginning any associated soil or groundwater management activity, the Contractor shall provide the Engineer with the opportunity to visually inspect and approve the equipment. If the equipment contains any contaminated residual material, decontamination shall be performed on the equipment as appropriate to the regulated substance and degree of contamination present according to OSHA and API guidelines. All cleaning fluids used shall be treated as the contaminant unless laboratory testing proves otherwise.

669.03 Pre-Construction Submittals and Qualifications. Prior to beginning this work, or working in areas with regulated substances, the Contractor shall submit a “Regulated Substances Pre-Construction Plan (RSPCP)” to the Engineer for review and approval using form BDE 2730. The form shall be signed by an Illinois licensed Professional Engineer or Professional Geologist.

As part of the RSPCP, the Contractor(s) or firm(s) performing the work shall meet the following qualifications.

- (a) Regulated Substances Monitoring. Qualification for environmental observation and field screening of regulated substances work and environmental observation of UST removal shall require either pre-qualification in Hazardous Waste by the Department or demonstration of acceptable project experience in remediation and operations for contaminated sites in accordance with applicable Federal, State, or local regulatory requirements using BDE 2730.

Qualification for each individual performing regulated substances monitoring shall require a minimum of one-year of experience in similar activities as those required for the project.

- (b) Underground Storage Tank Removal. Qualification for underground storage tank (UST) removal work shall require licensing and certification with the Office of the State Fire Marshall (OSFM) and possession of all permits required to perform the work. A copy of the permit shall be provided to the Engineer prior to tank removal.

The qualified Contractor(s) or firm(s) shall also document it does not have any current or former ties with any of the properties contained within, adjoining, or potentially affecting the work.

The Engineer will require up to 21 calendar days for review of the RSPCP. The review may involve rejection or revision and resubmittal; in which case, an additional 21 days will be required for each subsequent review. Work shall not commence until the RSPCP has been approved by the Engineer. After approval, the RSPCP shall be revised as necessary to reflect changed conditions in the field and documented using BDE 2730A "Regulated Substances Pre-Construction Plan (RSPCP) Addendum" and submitted to the Engineer for approval.

CONSTRUCTION REQUIREMENTS

669.04 Regulated Substances Monitoring. Regulated substances monitoring includes environmental observation and field screening during regulated substances management activities at the contract specific work areas. As part of the regulated substances monitoring, the monitoring personnel shall perform and document the applicable duties listed on form BDE 2732 "Regulated Substances Monitoring Daily Record (RSMDR)".

- (a) Environmental Observation. Prior to beginning excavation, the Contractor shall mark the limits of the contract specific work areas. Once work begins, the monitoring personnel shall be present on-site continuously during the excavation and loading of material.
- (b) Field Screening. Field screening shall be performed during the excavation and loading of material from the contract specific work areas, except for material classified according to Article 669.05(b)(1) or 669.05(c) where field screening is not required.

Field screening shall be performed with either a photoionization detector (PID) (minimum 10.6eV lamp) or a flame ionization detector (FID), and other equipment as appropriate, to monitor for potential contaminants associated with regulated substances. The PID or FID shall be calibrated on-site, and background level readings taken and recorded daily, and as field and weather conditions change. Field screen readings on the PID or FID in excess of background levels indicates the potential presence of regulated substances requiring handling as a non-special waste, special waste, or hazardous waste. PID or FID readings may be used as the basis of increasing the limits of removal with the approval of the Engineer but shall in no case be used to decrease the limits.

669.05 Regulated Substances Management and Disposal. The management and disposal of soil and/or groundwater containing regulated substances shall be according to the following:

- (a) Soil Analytical Results Exceed Most Stringent MAC. When the soil analytical results indicate detected levels exceed the most stringent maximum allowable concentration (MAC) for chemical constituents in soil established pursuant to Subpart F of 35 Ill. Adm. Code 1100.605, the soil shall be managed as follows:
 - (1) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC, but still considered within area background levels by the Engineer, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable. If the soils cannot be utilized within the right-of-way, they shall be managed and disposed of at a landfill as a non-special waste.
 - (2) When analytical results indicate inorganic chemical constituents exceed the most stringent MAC but do not exceed the MAC for a Metropolitan Statistical Area (MSA) County identified in 35 Ill. Admin. Code 742 Appendix A. Table G, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of at a clean construction and demolition debris (CCDD) facility or an uncontaminated soil fill operation (USFO) within an MSA County provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (3) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, or the MAC within the Chicago corporate limits, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site at a CCDD facility or an USFO within an MSA County excluding Chicago or within the Chicago corporate limits provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (4) When analytical results indicate chemical constituents exceed the most stringent MAC but do not exceed the MAC for an MSA County excluding Chicago, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site at a CCDD facility or an USFO within an MSA County excluding Chicago provided the pH of the soil is within the range of 6.25 - 9.0, inclusive.
 - (5) When the Engineer determines soil cannot be managed according to Articles 669.05(a)(1) through (a)(4) above and the materials do not contain special waste or hazardous waste, as determined by the Engineer, the soil shall be managed and disposed of at a landfill as a non-special waste.
 - (6) When analytical results indicate soil is hazardous by characteristic or listing pursuant to 35 Ill. Admin. Code 721, contains radiological constituents, or the Engineer otherwise determines the soil cannot be managed according to Articles 669.05(a)(1)

through (a)(5) above, the soil shall be managed and disposed of off-site as a special waste or hazardous waste as applicable.

(b) Soil Analytical Results Do Not Exceed Most Stringent MAC. When the soil analytical results indicate that detected levels do not exceed the most stringent MAC, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site according to Article 202.03. However, the excavated soil cannot be taken to a CCDD facility or an USFO for any of the following reasons.

(1) The pH of the soil is less than 6.25 or greater than 9.0.

(2) The soil exhibited PID or FID readings in excess of background levels.

(c) Soil Analytical Results Exceed Most Stringent MAC but Do Not Exceed Tiered Approach to Corrective Action Objectives (TACO) Residential. When the soil analytical results indicate that detected levels exceed the most stringent MAC but do not exceed TACO Tier 1 Soil Remediation Objectives for Residential Properties pursuant to 35 Ill. Admin. Code 742 Appendix B Table A, the excavated soil can be utilized within the right-of-way as embankment or fill, when suitable, or managed and disposed of off-site according to Article 202.03. However, the excavated soil cannot be taken to a CCDD facility or an USFO.

(d) Groundwater. When groundwater analytical results indicate the detected levels are above Appendix B, Table E of 35 Ill. Admin. Code 742, the most stringent Tier 1 Groundwater Remediation Objectives for Groundwater Component of the Groundwater Ingestion Route for Class 1 groundwater, the groundwater shall be managed off-site as a special waste or hazardous waste as applicable. Special waste groundwater shall be containerized and trucked to an off-site treatment facility, or may be discharged to a sanitary sewer or combined sewer when permitted by the local sewer authority. Groundwater discharged to a sanitary sewer or combined sewer shall be pre-treated to remove particulates and measured with a calibrated flow meter to comply with applicable discharge limits. A copy of the permit shall be provided to the Engineer prior to discharging groundwater to the sanitary sewer or combined sewer.

Groundwater encountered within trenches may be managed within the trench and allowed to infiltrate back into the ground. If the groundwater cannot be managed within the trench, it may be discharged to a sanitary sewer or combined sewer when permitted by the local sewer authority, or it shall be containerized and trucked to an off-site treatment facility as a special waste or hazardous waste. The Contractor is prohibited from discharging groundwater within the trench through a storm sewer. The Contractor shall install backfill plugs within the area of groundwater contamination.

One backfill plug shall be placed down gradient to the area of groundwater contamination. Backfill plugs shall be installed at intervals not to exceed 50 ft (15 m). Backfill plugs are to be 4 ft (1.2 m) long, measured parallel to the trench, full trench width and depth. Backfill plugs shall not have any fine aggregate bedding or backfill, but shall be entirely cohesive

soil or any class of concrete. The Contractor shall provide test data that the material has a permeability of less than 10^{-7} cm/sec according to ASTM D 5084, Method A or per another test method approved by the Engineer.

The Contractor shall use due care when transferring contaminated material from the area of origin to the transporter. Should releases of contaminated material to the environment occur (i.e., spillage onto the ground, etc.), the Contractor shall clean-up spilled material and place in the appropriate storage containers as previously specified. Clean-up shall include, but not be limited to, sampling beneath the material staging area to determine complete removal of the spilled material.

The Contractor shall provide engineered barriers, when required, and shall include materials sufficient to completely line excavation surfaces, including sloped surfaces, bottoms, and sidewall faces, within the areas designated for protection.

The Contractor shall obtain all documentation including any permits and/or licenses required to transport the material containing regulated substances to the disposal facility. The Contractor shall coordinate with the Engineer on the completion of all documentation. The Contractor shall make all arrangements for collection and analysis of landfill acceptance testing. The Contractor shall coordinate waste disposal approvals with the disposal facility.

The Contractor shall provide the Engineer with all transport-related documentation within two days of transport or receipt of said document(s). For management of special or hazardous waste, the Contractor shall provide the Engineer with documentation that the Contractor is operating with a valid Illinois special waste transporter permit at least two weeks before transporting the first load of contaminated material.

Transportation and disposal of material classified according to Article 669.05(a)(5) or 669.05(a)(6) shall be completed each day so that none of the material remains on-site by the close of business, except when temporary staging has been approved.

Any waste generated as a special or hazardous waste from a non-fixed facility shall be manifested off-site using the Department's county generator number provided by the Bureau of Design and Environment. An authorized representative of the Department shall sign all manifests for the disposal of the contaminated material and confirm the Contractor's transported volume. Any waste generated as a non-special waste may be managed off-site without a manifest, a special waste transporter, or a generator number.

The Contractor shall select a landfill permitted for disposal of the contaminant within the State of Illinois. The Department will review and approve or reject the facility proposed by the Contractor to use as a landfill. The Contractor shall verify whether the selected disposal facility is compliant with those applicable standards as mandated by their permit and whether the disposal facility is presently, has previously been, or has never been, on the United States Environmental Protection Agency (U.S. EPA) National Priorities List or the Resource Conservation and Recovery Act (RCRA) List of Violating Facilities. The use of a Contractor selected landfill shall in no manner delay the construction schedule or alter the Contractor's responsibilities as set forth.

669.06 Non-Special Waste Certification. An authorized representative of the Department shall sign and date all non-special waste certifications. The Contractor shall be responsible for providing the Engineer with the required information that will allow the Engineer to certify the waste is not a special waste.

(a) Definition. A waste is considered a non-special waste as long as it is not:

- (1) a potentially infectious medical waste;
- (2) a hazardous waste as defined in 35 Ill. Admin. Code 721;
- (3) an industrial process waste or pollution control waste that contains liquids, as determined using the paint filter test set forth in subdivision (3)(A) of subsection (m) of 35 Ill. Admin. Code 811.107;
- (4) a regulated asbestos-containing waste material, as defined under the National Emission Standards for Hazardous Air Pollutants in 40 CFR Part 61.141;
- (5) a material containing polychlorinated biphenyls (PCB's) regulated pursuant to 40 CFR Part 761;
- (6) a material subject to the waste analysis and recordkeeping requirements of 35 Ill. Admin. Code 728.107 under land disposal restrictions of 35 Ill. Admin. Code 728;
- (7) a waste material generated by processing recyclable metals by shredding and required to be managed as a special waste under Section 22.29 of the Environmental Protection Act; or
- (8) an empty portable device or container in which a special or hazardous waste has been stored, transported, treated, disposed of, or otherwise handled.

(b) Certification Information. All information used to determine the waste is not a special waste shall be attached to the certification. The information shall include but not be limited to:

- (1) the means by which the generator has determined the waste is not a hazardous waste;
- (2) the means by which the generator has determined the waste is not a liquid;
- (3) if the waste undergoes testing, the analytic results obtained from testing, signed and dated by the person responsible for completing the analysis;
- (4) if the waste does not undergo testing, an explanation as to why no testing is needed;

(5) a description of the process generating the waste; and

(6) relevant material safety data sheets.

669.07 Temporary Staging. Soil classified according to Articles 669.05(a)(2), (b)(1), or (c) may be temporarily staged at the Contractor's option. Soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) shall be managed and disposed of without temporary staging to the greatest extent practicable. If circumstances beyond the Contractor's control require temporary staging of these latter materials, the Contractor shall request approval from the Engineer in writing.

Temporary staging shall be accomplished within the right-of-way and the Contractor's means and methods shall be described in the approved or amended RSPCP. Staging areas shall not be located within 200 feet (61 m) of a public or private water supply well; nor within 100 feet (30 m) of sensitive environmental receptor areas, including wetlands, rivers, streams, lakes, or designated habitat zones.

The method of staging shall consist of containerization or stockpiling as applicable for the type, classification, and physical state (i.e., liquid, solid, semisolid) of the material. Materials of different classifications shall be staged separately with no mixing or co-mingling.

When containers are used, the containers and their contents shall remain intact and inaccessible to unauthorized persons until the manner of disposal is determined. The Contractor shall be responsible for all activities associated with the storage containers including, but not limited to, the procurement, transport, and labeling of the containers. The Contractor shall not use a storage container if visual inspection of the container reveals the presence of free liquids or other substances that could cause the waste to be reclassified as a hazardous or special waste.

When stockpiles are used, they shall be covered with a minimum 20-mil plastic sheeting or tarps secured using weights or tie-downs. Perimeter berms or diversionary trenches shall be provided to contain and collect for disposal any water that drains from the soil. Stockpiles shall be managed to prevent or reduce potential dust generation.

When staging non-special waste, special waste, or hazardous waste, the following additional requirements shall apply:

- (a) **Non-Special Waste.** When stockpiling soil classified according to Article 669.05(a)(1) or 669.05(a)(5), an impermeable surface barrier between the materials and the ground surface shall be installed. The impermeable barrier shall consist of a minimum 20-mil plastic liner material and the surface of the stockpile area shall be clean and free of debris prior to placement of the liner. Measures shall also be taken to limit or discourage access to the staging area.
- (b) **Special Waste and Hazardous Waste.** Soil classified according to Article 669.05(a)(6) shall not be stockpiled but shall be containerized immediately upon generation in containers, tanks or containment buildings as defined by RCRA, Toxic Substances Control

Act (TSCA), and other applicable State or local regulations and requirements, including 35 Ill. Admin. Code Part 722, Standards Applicable to Generators of Hazardous Waste.

The staging area(s) shall be enclosed (by a fence or other structure) to restrict direct access to the area, and all required regulatory identification signs applicable to a staging area containing special waste or hazardous waste shall be deployed.

Storage containers shall be placed on an all-weather gravel-packed, asphalt, or concrete surface. Containers shall be in good condition and free of leaks, large dents, or severe rusting, which may compromise containment integrity. Containers must be constructed of, or lined with, materials that will not react or be otherwise incompatible with the hazardous or special waste contents. Containers used to store liquids shall not be filled more than 80 percent of the rated capacity. Incompatible wastes shall not be placed in the same container or comingled.

All containers shall be legibly labeled and marked using pre-printed labels and permanent marker in accordance with applicable regulations, clearly showing the date of waste generation, location and/or area of waste generation, and type of waste. The Contractor shall place these identifying markings on an exterior side surface of the container.

Storage containers shall be kept closed, and storage pads covered, except when access is needed by authorized personnel.

Special waste and hazardous waste shall be transported and disposed within 90 days from the date of generation.

669.08 Underground Storage Tank Removal. For the purposes of this section, an underground storage tank (UST) includes the underground storage tank, piping, electrical controls, pump island, vent pipes and appurtenances.

Prior to removing an UST, the Engineer shall determine whether the Department is considered an "owner" or "operator" of the UST as defined by the UST regulations (41 Ill. Adm. Code Part 176). Ownership of the UST refers to the Department's owning title to the UST during storage, use or dispensing of regulated substances. The Department may be considered an "operator" of the UST if it has control of, or has responsibility for, the daily operation of the UST. The Department may however voluntarily undertake actions to remove an UST from the ground without being deemed an "operator" of the UST.

In the event the Department is deemed not to be the "owner" or "operator" of the UST, the OSFM removal permit shall reflect who was the past "owner" or "operator" of the UST. If the "owner" or "operator" cannot be determined from past UST registration documents from OSFM, then the OSFM removal permit will state the "owner" or "operator" of the UST is the Department. The Department's Office of Chief Counsel (OCC) will review all UST removal permits prior to submitting any removal permit to the OSFM. If the Department is not the "owner" or "operator" of the UST then it will not register the UST or pay any registration fee.

The Contractor shall be responsible for obtaining permits required for removing the UST, notification to the OSFM, using an OSFM certified tank contractor, removal and disposal of the UST and its contents, and preparation and submittal of the OSFM Site Assessment Report in accordance with 41 Ill. Admin. Code Part 176.330.

The Contractor shall contact the Engineer and the OSFM's office at least 72 hours prior to removal to confirm the OSFM inspector's presence during the UST removal. Removal, transport, and disposal of the UST shall be according to the applicable portions of the latest revision of the "American Petroleum Institute (API) Recommended Practice 1604".

The Contractor shall collect and analyze tank content (sludge) for disposal purposes. The Contractor shall remove as much of the regulated substance from the UST system as necessary to prevent further release into the environment. All contents within the tank shall be removed, transported and disposed of, or recycled. The tank shall be removed and rendered empty according to IEPA definition.

The Contractor shall collect soil samples from the bottom and sidewalls of the excavated area in accordance with 35 Ill. Admin. Code Part 734.210(h) after the required backfill has been removed during the initial response action, to determine the level of contamination remaining in the ground, regardless if a release is confirmed or not by the OSFM on-site inspector.

In the event the UST is designated a leaking underground storage tank (LUST) by the OSFM's inspector, or confirmation by analytical results, the Contractor shall notify the Engineer and the District Environmental Studies Unit (DESU). Upon confirmation of a release of contaminants and notifications to the Engineer and DESU, the Contractor shall report the release to the Illinois Emergency Management Agency (IEMA) (e.g., by telephone or electronic mail) and provide them with whatever information is available ("owner" or "operator" shall be stated as the past registered "owner" or "operator", or the IDOT District in which the tank is located and the DESU Manager).

The Contractor shall perform the following initial response actions if a release is indicated by the OSFM inspector:

- (a) Take immediate action to prevent any further release of the regulated substance to the environment, which may include removing, at the Engineer's discretion, and disposing of up to 4 ft (1.2 m) of the contaminated material, as measured from the outside dimension of the tank;
- (b) Identify and mitigate fire, explosion and vapor hazards;
- (c) Visually inspect any above ground releases or exposed below ground releases and prevent further migration of the released substance into surrounding soils and groundwater; and
- (d) Continue to monitor and mitigate any additional fire and safety hazards posed by vapors and free product that have migrated from the tank excavation zone and entered into subsurface structures (such as sewers or basements).

The tank excavation shall be backfilled according to applicable portions of Sections 205, 208, and 550 with a material that will compact and develop stability. All uncontaminated concrete and soil removed during tank extraction may be used to backfill the excavation, at the discretion of the Engineer.

After backfilling the excavation, the site shall be graded and cleaned.

669.09 Regulated Substances Final Construction Report. Not later than 90 days after completing this work, the Contractor shall submit a “Regulated Substances Final Construction Report (RSFCR)” to the Engineer using form BDE 2733 and required attachments. The form shall be signed by an Illinois licensed Professional Engineer or Professional Geologist.

669.10 Method of Measurement. Non-special waste, special waste, and hazardous waste soil will be measured for payment according to Article 202.07(b) when performing earth excavation, Article 502.12(b) when excavating for structures, or by computing the volume of the trench using the maximum trench width permitted and the actual depth of the trench.

Groundwater containerized and transported off-site for management, storage, and disposal will be measured for payment in gallons (liters).

Backfill plugs will be measured in cubic yards (cubic meters) in place, except the quantity for which payment will be made shall not exceed the volume of the trench, as computed by using the maximum width of trench permitted by the Specifications and the actual depth of the trench, with a deduction for the volume of the pipe.

Engineered Barriers will be measured for payment in square yards (square meters).

669.11 Basis of Payment. The work of preparing, submitting and administering a Regulated Substances Pre-Construction Plan will be paid for at the contract lump sum price for REGULATED SUBSTANCES PRE-CONSTRUCTION PLAN.

Regulated substances monitoring, including completion of form BDE 2732 for each day of work, will be paid for at the contract unit price per calendar day, or fraction thereof to the nearest 0.5 calendar day, for REGULATED SUBSTANCES MONITORING.

The installation of engineered barriers will be paid for at the contract unit price per square yard (square meter) for ENGINEERED BARRIER.

The work of UST removal, soil excavation, soil and content sampling, the management of excavated soil and UST content, and UST disposal, will be paid for at the contract unit price per each for UNDERGROUND STORAGE TANK REMOVAL.

The transportation and disposal of soil and other materials from an excavation determined to be contaminated will be paid for at the contract unit price per cubic yard (cubic meter) for

NON-SPECIAL WASTE DISPOSAL, SPECIAL WASTE DISPOSAL, or HAZARDOUS WASTE DISPOSAL.

The transportation and disposal of groundwater from an excavation determined to be contaminated will be paid for at the contract unit price per gallon (liter) for SPECIAL WASTE GROUNDWATER DISPOSAL or HAZARDOUS WASTE GROUNDWATER DISPOSAL. When groundwater is discharged to a sanitary or combined sewer by permit, the cost will be paid for according to Article 109.05.

Backfill plugs will be paid for at the contract unit price per cubic yard (cubic meter) for BACKFILL PLUGS.

Payment for temporary staging of soil classified according to Articles 669.05(a)(1), (a)(3), (a)(4), (a)(5), (a)(6), or (b)(2) will be paid for according to Article 109.04. The Department will not be responsible for any additional costs incurred, if mismanagement of the staging area, storage containers, or their contents by the Contractor results in excess cost expenditure for disposal or other material management requirements.

Payment for accumulated stormwater removal and disposal will be according to Article 109.04. Payment will only be allowed if appropriate stormwater and erosion control methods were used.

Payment for decontamination, labor, material, and equipment for monitoring areas beyond the specified areas, with the Engineer's prior written approval, will be according to Article 109.04.

When the waste material for disposal requires sampling for landfill disposal acceptance, the samples shall be analyzed for TCLP VOCs, SVOCs, RCRA metals, pH, ignitability, and paint filter test. The analysis will be paid for at the contract unit price per each for SOIL DISPOSAL ANALYSIS using EPA Methods 1311 (extraction), 8260B for VOCs, 8270C for SVOCs, 6010B and 7470A for RCRA metals, 9045C for pH, 1030 for ignitability, and 9095A for paint filter.

The work of preparing, submitting and administering a Regulated Substances Final Construction Report will be paid for at the contract lump sum price REGULATED SUBSTANCES FINAL CONSTRUCTION REPORT."

80407

SILT FENCE, INLET FILTERS, GROUND STABILIZATION AND RIPRAP FILTER FABRIC (BDE)

Effective: November 1, 2019

Revised: April 1, 2020

Revise Article 280.02(m) and add Article 280.02(n) so the Standard Specifications read:

“(m) Above Grade Inlet Filter (Fitted)..... 1081.15(j)
 (n) Above Grade Inlet Filter (Non-Fitted)..... 1081.15(k)”

Revise the last sentence of the first paragraph in Article 280.04(c) of the Standard Specifications to read:

“The protection shall be constructed with hay or straw bales, silt filter fence, above grade inlet filters (fitted and non-fitted), or inlet filters.

Revise the first sentence of the second paragraph in Article 280.04(c) of the Standard Specifications to read:

“When above grade inlet filters (fitted and non-fitted) are specified, they shall be of sufficient size to completely span and enclose the inlet structure.”

Revise Article 1080.02 of the Standard Specifications to read:

“1080.02 Geotextile Fabric. The fabric for silt filter fence shall consist of woven fabric meeting the requirements of AASHTO M 288 for unsupported silt fence.

The fabric for ground stabilization shall consist of woven yarns or nonwoven filaments of polyolefins or polyesters. Woven fabrics shall be Class 2 and nonwoven fabrics shall be Class 1 according to AASHTO M 288.

The physical properties for silt fence and ground stabilization fabrics shall be according to the following.

PHYSICAL PROPERTIES			
	Silt Fence Woven ^{1/}	Ground Stabilization Woven ^{2/}	Ground Stabilization Nonwoven ^{2/}
Grab Strength, lb (N) ^{3/} ASTM D 4632	123 (550) MD 101 (450) XD	247 (1100) min. ^{4/}	202 (900) min. ^{4/}
Elongation/Grab Strain, % ASTM D 4632 ^{4/}	49 max.	49 max.	50 min.
Trapezoidal Tear Strength, lb (N) ASTM D 4533 ^{4/}	--	90 (400) min.	79 (350) min.

Puncture Strength, lb (N) ASTM D 6241 ^{4/}	--	494 (2200) min.	433 (1925) min.
Apparent Opening Size, Sieve No. (mm) ASTM D 4751 ^{5/}	30 (0.60) max.	40 (0.43) max.	40 (0.43) max.
Permittivity, sec ⁻¹ ASTM D 4491	0.05 min.		
Ultraviolet Stability, % retained strength after 500 hours of exposure ASTM D 4355	70 min.	50 min.	50 min.

- 1/ NTPEP results or manufacturer's certification to meet test requirements.
- 2/ NTPEP results to meet test requirements. Manufacturer shall have public release status and current reports on laboratory results in Test Data of NTPEP's DataMine.
- 3/ MD = Machine direction. XD = Cross-machine direction.
- 4/ Values represent the minimum average roll value (MARV) in the weaker principle direction, MD or XD.
- 5/ Values represent the maximum average roll value."

Revise Article 1080.03 of the Standard Specifications to read:

“1080.03 Filter Fabric. The filter fabric shall consist of woven yarns or nonwoven filaments of polyolefins or polyesters. Woven fabrics shall be Class 3 for riprap gradations RR 4 and RR 5, and Class 2 for RR 6 and RR 7 according to AASHTO M 288. Woven slit film geotextiles (i.e. geotextiles made from yarns of a flat, tape-like character) shall not be permitted. Nonwoven fabrics shall be Class 2 for riprap gradations RR 4 and RR 5, and Class 1 for RR 6 and RR 7 according to AASHTO M 288. After forming, the fabric shall be processed so that the yarns or filaments retain their relative positions with respect to each other. The fabric shall be new and undamaged.

The filter fabric shall be manufactured in widths of not less than 6 ft (2 m). Sheets of fabric may be sewn together with thread of a material meeting the chemical requirements given for the yarns or filaments to form fabric widths as required. The sheets of filter fabric shall be sewn together at the point of manufacture or another approved location.

The filter fabric shall be according to the following.

PHYSICAL PROPERTIES ^{1/}				
	Gradation Nos. RR 4 & RR 5		Gradation Nos. RR 6 & RR 7	
	Woven	Nonwoven	Woven	Nonwoven
Grab Strength, lb (N) ASTM D 4632 ^{2/}	180 (800) min.	157 (700) min.	247 (1100) min.	202 (900) min.
Elongation/Grab Strain, % ASTM D 4632 ^{2/}	49 max.	50 min.	49 max.	50 min.
Trapezoidal Tear Strength, lb (N) ASTM D 4533 ^{2/}	67 (300) min.	56 (250) min.	90 (400) min.	79 (350) min.
Puncture Strength, lb (N) ASTM D 6241 ^{2/}	370 (1650) min.	309 (1375) min.	494 (2200) min.	433 (1925) min.
Ultraviolet Stability, % retained strength after 500 hours of exposure - ASTM D 4355	50 min.			

1/ NTPEP results to meet test requirements. Manufacturer shall have public release status and current reports on laboratory results in Test Data of NTPEP's DataMine.

2/ Values represent the minimum average roll value (MARV) in the weaker principle direction [machine direction (MD) or cross-machine direction (XD)].

As determined by the Engineer, the filter fabric shall meet the requirements noted in the following after an onsite investigation of the soil to be protected.

Soil by Weight (Mass) Passing the No. 200 sieve (75 µm), %	Apparent Opening Size, Sieve No. (mm) - ASTM D 4751 ^{1/}	Permittivity, sec ⁻¹ ASTM D 4491
49 max.	60 (0.25) max.	0.2 min.
50 min.	70 (0.22) max.	0.1 min.

1/ Values represent the maximum average roll value.”

Revise Article 1081.15(h)(3)a of the Standard Specifications to read:

“a. Inner Filter Fabric Bag. The inner filter fabric bag shall be constructed of woven yarns or nonwoven filaments made of polyolefins or polyesters with a minimum silt and debris capacity of 2.0 cu ft (0.06 cu m). Woven fabric shall be Class 3 and nonwoven fabric shall be Class 2 according to AASHTO M 288. The fabric bag shall be according to the following.

PHYSICAL PROPERTIES		
	Woven	Nonwoven
Grab Strength, lb (N) ASTM D 4632 ^{1/}	180 (800) min.	157 (700) min.
Elongation/Grab Strain, % ASTM D 4632 ^{1/}	49 max.	50 min.
Trapezoidal Tear Strength, lb (N) ASTM D 4533 ^{1/}	67 (300) min.	56 (250) min.
Puncture Strength, lb (N) ASTM D 6241 ^{1/}	370 (1650) min.	309 (1375) min.
Apparent Opening Size, Sieve No. (mm) ASTM D 4751 ^{2/}	60 (0.25) max.	
Permittivity, sec ⁻¹ ASTM D 4491	2.0 min.	
Ultraviolet Stability, % retained strength after 500 hours of exposure – ASTM D 4355	70 min.	

1/ Values represent the minimum average roll value (MARV) in the weaker principle direction [machine direction (MD) or cross-machine direction (XD)].

2/ Values represent the maximum average roll value.”

Revise Article 1081.15(i)(1) of the Standard Specifications to read:

“(i) Urethane Foam/Geotextile. Urethane foam/geotextile shall be triangular shaped having a minimum height of 10 in. (250 mm) in the center with equal sides and a minimum 20 in. (500 mm) base. The triangular shaped inner material shall be a low density urethane foam. The outer geotextile fabric cover shall consist of woven yarns or nonwoven filaments made of polyolefins or polyesters placed around the inner material and shall extend beyond both sides of the triangle a minimum of 18 in. (450 mm). Woven filter fabric shall be Class 3 and nonwoven filter fabric shall be Class 2 according to AASHTO M 288.

(1) The geotextile shall meet the following properties.

PHYSICAL PROPERTIES		
	Woven	Nonwoven
Grab Strength, lb (N) ASTM D 4632 ^{1/}	180 (800) min.	157 (700) min.
Elongation/Grab Strain, % ASTM D 4632 ^{1/}	49 max.	50 min.
Trapezoidal Tear Strength, lb (N) ASTM D 4533 ^{1/}	67 (300) min.	56 (250) min.
Puncture Strength, lb (N) ASTM D 6241 ^{1/}	370 (1650) min.	309 (1375) min.

Apparent Opening Size, Sieve No. (mm) ASTM D 4751 ^{2/}	30 (0.60) max.
Permittivity, sec ⁻¹ ASTM D 4491	2.0 min.
Ultraviolet Stability, % retained strength after 500 hours of exposure – ASTM D 4355	70 min.

1/ Values represent the minimum average roll value (MARV) in the weaker principle direction [machine direction (MD) or cross-machine direction (XD)].

2/ Values represent the maximum average roll value.”

Add the following to Article 1081.15(i) of the Standard Specifications.

“(3) Certification. The manufacturer shall furnish a certificate with each shipment of urethane foam/geotextile assemblies stating the amount of product furnished and that the material complies with these requirements.”

Revise the title and first sentence of Article 1081.15(j) of the Standards Specifications to read:

“(j) Above Grade Inlet Filters (Fitted). Above grade inlet filters (fitted) shall consist of a rigid polyethylene frame covered with a fitted geotextile filter fabric.”

Revise Article 1081.15(j)(2) of the Standard Specifications to read:

(2) Fitted Geotextile Filter Fabric. The fitted geotextile filter fabric shall consist of woven yarns or nonwoven filaments made of polyolefins or polyesters. Woven filter fabric shall be Class 3 and nonwoven filter fabric shall be Class 2 according to AASHTO M 288. The filter shall be fabricated to provide a direct fit to the frame. The top of the filter shall integrate a coarse screen with a minimum apparent opening size of 1/2 in. (13 mm) to allow large volumes of water to pass through in the event of heavy flows. The filter shall have integrated anti-buoyancy pockets capable of holding a minimum of 3.0 cu ft (0.08 cu m) of stabilization material. Each filter shall have a label with the following information sewn to or otherwise permanently adhered to the outside: manufacturer’s name, product name, and lot, model, or serial number. The fitted geotextile filter fabric shall be according to the table in Article 1081.15(h)(3)a above.”

Add Article 1081.15(k) to the Standard Specifications to read:

“(k) Above Grade Inlet Filters (Non-Fitted). Above grade inlet filters (non-fitted) shall consist of a geotextile fabric surrounding a metal frame. The frame shall consist of either a) a circular cage formed of welded wire mesh, or b) a collapsible aluminum frame, as described below.

(1) Frame Construction.

- a) Welded Wire Mesh Frame. The frame shall consist of 6 in. x 6 in. (150 mm x 150 mm) welded wire mesh formed of #10 gauge (3.42 mm) steel conforming to ASTM A 185. The mesh shall be 30 in. (750 mm) tall and formed into a 42 in. (1.05 m) minimum diameter cylinder.
 - b) Collapsible Aluminum Frame. The collapsible aluminum frame shall consist of grade 6036 aluminum. The frame shall have anchor lugs that attach it to the inlet grate, which shall resist movement from water and debris. The collapsible joints of the frame shall have a locking device to secure the vertical members in place, which shall prevent the frame from collapsing while under load from water and debris.
- (2) Geotextile Fabric. The geotextile fabric shall consist of woven yarns or nonwoven filaments made of polyolefins or polyesters. The woven filter fabric shall be a Class 3 and the nonwoven filter fabric shall be a Class 2 according to AASHTO M 288. The geotextile fabric shall be according to the table in Article 1081.15(h)(3)a above.
- (3) Geotechnical Fabric Attachment to the Frame.
- a) Welded Wire Mesh Frame. The woven or nonwoven geotextile fabric shall be wrapped 3 in. (75 mm) over the top member of a 6 in. x 6 in. (150 mm x 150 mm) welded wire mesh frame and secured with fastening rings constructed of wire conforming to ASTM A 641, A 809, A 370, and A 938 at 6 in. (150 mm) on center. The fastening rings shall penetrate both layers of geotextile and securely close around the steel mesh. The geotextile shall be secured to the sides of the welded wire mesh with fastening rings at a spacing of 1 per sq ft (11 per sq m) and securely close around a steel member.
 - b) Collapsible Aluminum Frame. The woven or nonwoven fabric shall be secured to the aluminum frame along the top and bottom of the frame perimeter with strips of aluminum secured to the perimeter member, such that the anchoring system provides a uniformly distributed stress throughout the geotechnical fabric.
- (4) Certification. The manufacturer shall furnish a certificate with each shipment of above grade inlet filter assemblies stating the amount of product furnished and that the material complies with these requirements.”

80419

STEEL COST ADJUSTMENT (BDE)

Effective: April 2, 2004

Revised: August 1, 2017

Description. Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices when optioned by the Contractor. The bidder shall indicate with their bid whether or not this special provision will be part of the contract. Failure to indicate "Yes" for any item of work will make that item of steel exempt from steel cost adjustment.

Types of Steel Products. An adjustment will be made for fluctuations in the cost of steel used in the manufacture of the following items:

- Metal Piling (excluding temporary sheet piling)
- Structural Steel
- Reinforcing Steel

Other steel materials such as dowel bars, tie bars, mesh reinforcement, guardrail, steel traffic signal and light poles, towers and mast arms, metal railings (excluding wire fence), and frames and grates will be subject to a steel cost adjustment when the pay items they are used in have a contract value of \$10,000 or greater.

The adjustments shall apply to the above items when they are part of the original proposed construction, or added as extra work and paid for by agreed unit prices. The adjustments shall not apply when the item is added as extra work and paid for at a lump sum price or by force account.

Documentation. Sufficient documentation shall be furnished to the Engineer to verify the following:

- (a) The dates and quantity of steel, in lb (kg), shipped from the mill to the fabricator.
- (b) The quantity of steel, in lb (kg), incorporated into the various items of work covered by this special provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment. Steel cost adjustments will be computed as follows:

$$SCA = Q \times D$$

Where: SCA = steel cost adjustment, in dollars
Q = quantity of steel incorporated into the work, in lb (kg)
D = price factor, in dollars per lb (kg)

$$D = MPI_M - MPI_L$$

Where: MPI_M = The Materials Cost Index for steel as published by the Engineering News-Record for the month the steel is shipped from the mill. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

MPI_L = The Materials Cost Index for steel as published by the Engineering News-Record for the month prior to the letting for work paid for at the contract price; or for the month the agreed unit price letter is submitted by the Contractor for extra work paid for by agreed unit price,. The indices will be converted from dollars per 100 lb to dollars per lb (kg).

The unit weights (masses) of steel that will be used to calculate the steel cost adjustment for the various items are shown in the attached table.

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the letting date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the MPI_M will be based on the date the steel arrives at the job site. In this case, an adjustment will only be made when there is a decrease in steel costs.

Basis of Payment. Steel cost adjustments may be positive or negative but will only be made when there is a difference between the MPI_L and MPI_M in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(MPI_L - MPI_M) \div MPI_L\} \times 100$$

Steel cost adjustments will be calculated by the Engineer and will be paid or deducted when all other contract requirements for the items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The adjustments shall not apply during contract time subject to liquidated damages for completion of the entire contract.

Attachment

Item	Unit Mass (Weight)
Metal Piling (excluding temporary sheet piling) Furnishing Metal Pile Shells 12 in. (305 mm), 0.179 in. (3.80 mm) wall thickness) Furnishing Metal Pile Shells 12 in. (305 mm), 0.250 in. (6.35 mm) wall thickness) Furnishing Metal Pile Shells 14 in. (356 mm), 0.250 in. (6.35 mm) wall thickness) Other piling	23 lb/ft (34 kg/m) 32 lb/ft (48 kg/m) 37 lb/ft (55 kg/m) See plans
Structural Steel	See plans for weights (masses)
Reinforcing Steel	See plans for weights (masses)
Dowel Bars and Tie Bars	6 lb (3 kg) each
Mesh Reinforcement	63 lb/100 sq ft (310 kg/sq m)
Guardrail Steel Plate Beam Guardrail, Type A w/steel posts Steel Plate Beam Guardrail, Type B w/steel posts Steel Plate Beam Guardrail, Types A and B w/wood posts Steel Plate Beam Guardrail, Type 2 Steel Plate Beam Guardrail, Type 6 Traffic Barrier Terminal, Type 1 Special (Tangent) Traffic Barrier Terminal, Type 1 Special (Flared)	20 lb/ft (30 kg/m) 30 lb/ft (45 kg/m) 8 lb/ft (12 kg/m) 305 lb (140 kg) each 1260 lb (570 kg) each 730 lb (330 kg) each 410 lb (185 kg) each
Steel Traffic Signal and Light Poles, Towers and Mast Arms Traffic Signal Post Light Pole, Tenon Mount and Twin Mount, 30 - 40 ft (9 - 12 m) Light Pole, Tenon Mount and Twin Mount, 45 - 55 ft (13.5 - 16.5 m) Light Pole w/Mast Arm, 30 - 50 ft (9 - 15.2 m) Light Pole w/Mast Arm, 55 - 60 ft (16.5 - 18 m) Light Tower w/Luminaire Mount, 80 - 110 ft (24 - 33.5 m) Light Tower w/Luminaire Mount, 120 - 140 ft (36.5 - 42.5 m) Light Tower w/Luminaire Mount, 150 - 160 ft (45.5 - 48.5 m)	11 lb/ft (16 kg/m) 14 lb/ft (21 kg/m) 21 lb/ft (31 kg/m) 13 lb/ft (19 kg/m) 19 lb/ft (28 kg/m) 31 lb/ft (46 kg/m) 65 lb/ft (97 kg/m) 80 lb/ft (119 kg/m)
Metal Railings (excluding wire fence) Steel Railing, Type SM Steel Railing, Type S-1 Steel Railing, Type T-1 Steel Bridge Rail	64 lb/ft (95 kg/m) 39 lb/ft (58 kg/m) 53 lb/ft (79 kg/m) 52 lb/ft (77 kg/m)
Frames and Grates Frame Lids and Grates	250 lb (115 kg) 150 lb (70 kg)

80127

STEEL PLATE BEAM GUARDRAIL MANUFACTURING (BDE)

Effective: January 1, 2019

Revise the first three paragraphs of Article 1006.25 of the Standard Specifications to read:

“1006.25 Steel Plate Beam Guardrail. Steel plate beam guardrail, including bolts, nuts, and washers, shall be according to AASHTO M 180. The guardrail shall be Class A, with a Type II galvanized coating.

Steel plates for mounting guardrail on existing culverts shall be according to AASHTO M 270 Grade 36 (M 270M Grade 250) and zinc coated according to AASHTO M 111.

The Department will accept guardrail based on the “Brand Registration and Guarantee” requirements of AASHTO M 180 and the manufacturer shall be listed as compliant through the NTPEP Program. The Department will maintain a qualified product list.”

80408

SUBCONTRACTOR AND DBE PAYMENT REPORTING (BDE)

Effective: April 2, 2018

Add the following to Section 109 of the Standard Specifications.

“109.14 Subcontractor and Disadvantaged Business Enterprise Payment Reporting.
The Contractor shall report all payments made to the following parties:

- (a) first tier subcontractors;
- (b) lower tier subcontractors affecting disadvantaged business enterprise (DBE) goal credit;
- (c) material suppliers or trucking firms that are part of the Contractor’s submitted DBE utilization plan.

The report shall be made through the Department’s on-line subcontractor payment reporting system within 21 days of making the payment.”

80397

SUBCONTRACTOR MOBILIZATION PAYMENTS (BDE)

Effective: November 2, 2017

Revised: April 1, 2019

Replace the second paragraph of Article 109.12 of the Standard Specifications with the following:

“This mobilization payment shall be made at least seven days prior to the subcontractor starting work. The amount paid shall be at the following percentage of the amount of the subcontract reported on form BC 260A submitted for the approval of the subcontractor’s work.

Value of Subcontract Reported on Form BC 260A	Mobilization Percentage
Less than \$10,000	25%
\$10,000 to less than \$20,000	20%
\$20,000 to less than \$40,000	18%
\$40,000 to less than \$60,000	16%
\$60,000 to less than \$80,000	14%
\$80,000 to less than \$100,000	12%
\$100,000 to less than \$250,000	10%
\$250,000 to less than \$500,000	9%
\$500,000 to \$750,000	8%
Over \$750,000	7%”

80391

SURFACE TESTING OF PAVEMENTS – IRI (BDE)

Effective: January 1, 2021

Revised: April 1, 2021

Description. This work shall consist of testing the ride quality of the finished surface of pavements, according to Illinois Test Procedure 701, “Ride Quality Testing Using the International Roughness Index (IRI)”. Work shall be according to Sections 406, 407, or 420 of the Standard Specifications, except as modified herein.

Hot-Mix Asphalt (HMA) Overlays

Revise Article 406.03(h) of the Standard Specifications to read:

“(h) Pavement Surface Grinding Equipment..... 1101.04”

Revise Article 406.11 of the Standard Specifications to read:

“406.11 Surface Tests. Prior to pavement improvements, the Engineer will measure the smoothness of the existing high-speed mainline pavement. The Contractor shall measure the smoothness of the finished high-speed mainline, low-speed mainline, and miscellaneous pavements within three days of paving. Testing shall be performed in the presence of the Engineer and according to Illinois Test Procedure 701. The pavement will be identified as high-speed mainline, low-speed mainline, or miscellaneous as follows.

(a) Test Sections

- (1) High-Speed Mainline Pavement. High-speed mainline pavement shall consist of pavements, ramps, and loops with a posted speed limit greater than 45 mph. These sections shall be tested with an inertial profiling system (IPS).
- (2) Low-Speed Mainline Pavement. Low-speed mainline pavement shall consist of pavements, ramps, and loops with a posted speed limit of 45 mph or less. These sections shall be tested with an IPS and analyzed using the rolling straightedge simulation in ProVAL.
- (3) Miscellaneous Pavement. Miscellaneous pavement includes segments that either cannot readily be tested by an inertial profiler or conditions beyond the control of the contractor preclude the achievement of smoothness levels typically achievable with mainline pavement construction. This may include the following examples or as determined by the Engineer.
 - (a) Pavement on horizontal curves with a centerline radius of curvature of less than or equal to 1,000 ft (300 m) and the pavement within the superelevation transition of such curves;

- (b) Pavement on vertical curves having a length less than or equal to 200 ft (60 m) in combination with an algebraic change in tangent grade greater than or equal to 3 percent as may occur on urban ramps or other constricted-space facilities;
- (c) The first and last 50 ft (15 m) of a pavement section where the Contractor is not responsible for the adjoining surface;
- (d) Intersections and the 25 ft (7.6 m) before and after an intersection or end of radius return;
- (e) Variable width pavements;
- (f) Side street returns, to the end of radius return;
- (g) Crossovers;
- (h) Connector pavement from the mainline pavement expansion joint to the bridge approach slab;
- (i) Bridge approach slab;
- (j) Pavement that must be constructed in multiple short segments, typically defined as 600 ft (180 m) or less;
- (k) Pavement within 25 ft (7.6 m) of manholes, utility structures, or other appurtenances;
- (l) Turn lanes.

Miscellaneous pavement shall be tested using a 16 ft (5 m) straightedge.

- (4) International Roughness Index (IRI). An index computed from a longitudinal profile measurement using a quarter-car simulation at a simulation speed of 50 mph (80 km/h).
- (5) Mean Roughness Index (MRI). The average of the IRI values for the right and left wheel tracks.
- (6) Areas of Localized Roughness (ALR). Isolated areas of roughness, which can cause significant increase in the calculated MRI for a given subplot.
- (7) Lot. A lot will be defined as a continuous strip of pavement 1 mile (1,600 m) long and one lane wide. When the length of a continuous strip of pavement is less than 1 mile (1,600 m), that pavement will be included in an adjacent lot. Structures will be omitted when measuring pavement length, but will not be considered as a discontinuity and

the numbering of sublots will not restart. The limits of the structure shall include the entire length between the outside ends of both connector pavements.

- (8) Sublot. Lots will be divided into 0.1 mile (160 m) sublots. A partial sublot greater than or equal to 264 ft (80 m) resulting from an interruption in the pavement will be subject to the same evaluation as a whole sublot. Partial sublots less than 264 ft (80 m) shall be included with the previous sublot for evaluation purposes.

(b) Corrective Work. Corrective work shall be completed according to the following.

- (1) High-Speed Mainline Pavement. For high-speed mainline pavement, any 25 ft (7.6 m) interval with an ALR in excess of 150 in./mile (2,400 mm/km) will be identified by the Engineer and shall be corrected by the Contractor. Any sublot having a MRI greater than 100.0 in./mile (1,580 mm/km), including ALR, shall be corrected to reduce the MRI to the full pay threshold, or replaced at the Contractor's option.
- (2) Low-Speed Mainline and Miscellaneous Pavements. Bumps in low-speed mainline pavement or miscellaneous pavement which exceed the 5/16 in. (8 mm) tolerance on a simulated 16 ft (5 m) straightedge will be identified by the Engineer and shall be corrected by the Contractor.

Corrective work shall be completed with pavement surface grinding equipment or by removing and replacing the pavement. Corrective work shall be applied to the full lane width. When completed, the corrected area shall have uniform texture and appearance, with the beginning and ending of the corrected area normal to the centerline of the paved surface.

Upon completion of the corrective work, the surface of the sublot(s) shall be retested. The Contractor shall furnish the data and reports to the Engineer within 2 working days after corrections are made. If the MRI and/or ALR still do not meet the requirements, additional corrective work shall be performed. For sublot(s) that are replaced, assessments will be based on the MRI determined after replacement.

Corrective work shall be at no additional cost to the Department.

(c) Smoothness Assessments. Assessments will be paid to or deducted from the Contractor for each sublot of mainline pavement per the Smoothness Assessment Schedule. Assessments will be based on the MRI of each sublot prior to performing any corrective work unless the Contractor has chosen to remove and replace the sublot. For sublots that are replaced, assessments will be based on the MRI determined after replacement.

- (1) High-Speed Mainline Pavement. The upper MRI thresholds for high-speed mainline pavement are dependent on the MRI of the existing pavement before construction (MRI₀) and shall be determined as follows.

Upper MRI Thresholds ^{1/}	MRI Thresholds (High-Speed, HMA Overlay)
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	MRI ₀ ≤ 125.0 in./mile (≤ 1,975 mm/km)	MRI ₀ > 125.0 in./mile ^{1/} (> 1,975 mm/km)
Incentive (MRI _I)	45.0 in./mile (710 mm/km)	0.2 × MRI ₀ + 20
Full Pay (MRI _F)	75.0 in./mile (1,190 mm/km)	0.2 × MRI ₀ + 50
Disincentive (MRI _D)	100.0 in./mile (1,975 mm/km)	0.2 × MRI ₀ + 75

1/ MRI₀, MRI_I, MRI_F, and MRI_D shall be in in./mile for calculation.

Smoothness assessments for high-speed mainline pavement shall be determined as follows.

SMOOTHNESS ASSESSMENT SCHEDULE (High-Speed, HMA Overlay)	
Mainline Pavement MRI Range	Assessment Per Sublot ^{1/}
MRI ≤ MRI _I	+ (MRI _I – MRI) × \$33.00 ^{2/}
MRI _I < MRI ≤ MRI _F	+ \$0.00
MRI _F < MRI ≤ MRI _D	– (MRI – MRI _F) × \$20.00
MRI > MRI _D	– \$500.00

1/ MRI, MRI_I, MRI_F, and MRI_D shall be in in./mile for calculation.

2/ The maximum incentive amount shall not exceed \$500.00.

Smoothness assessments will not be paid or deducted until all other contract requirements for the pavement are satisfied. Pavement that is corrected or replaced for reasons other than smoothness, shall be retested as stated herein.”

Hot-Mix Asphalt (HMA) Pavement (Full-Depth)

Revise the first paragraph of Article 407.03 of the Standard Specifications to read:

“407.03 Equipment. Equipment shall be according to Article 406.03.”

Revise Article 407.09 of the Standard Specifications to read:

“407.09 Surface Tests. The finished surface of the pavement shall be tested for smoothness according to Article 406.11, except as follows:

The testing of the existing pavement prior to improvements shall not apply and the smoothness assessment for high-speed mainline pavement shall be determined according to the following table.

SMOOTHNESS ASSESSMENT SCHEDULE (High-Speed, Full-Depth HMA)

Mainline Pavement MRI, in./mile (mm/km)	Assessment Per Sublot ^{1/}
≤ 45.0 (710)	+ (45 – MRI) × \$80.00 ^{2/}
> 45.0 (710) to 75.0 (1,190)	+ \$0.00
> 75.0 (1,190) to 100.0 (1,580)	– (MRI – 75) × \$30.00
> 100.0 (1,580)	– \$750.00

1/ MRI shall be in in./mile for calculation.

2/ The maximum incentive amount shall not exceed \$1,200.00.”

Portland Cement Concrete Pavement

Delete Article 420.03(i) of the Standard Specifications.

Revise Article 420.03(j) of the Standard Specifications to read:

“(i) Coring Machine (Note 1)”

Revise Article 420.10 of the Standard Specifications to read:

“**420.10 Surface Tests.** The finished surface of the pavement shall be tested for smoothness according to Article 406.11, except as follows.

The testing of the existing pavement prior to improvements shall not apply. The Contractor shall measure the smoothness of the finished surface of the pavement after the pavement has attained a flexural strength of 250 psi (3,800 kPa) or a compressive strength of 1,600 psi (20,700 kPa).

Membrane curing damaged during testing shall be repaired as directed by the Engineer at no additional cost to the Department.

- (a) Corrective Work. No further texturing for skid resistance will be required for areas corrected by grinding. Protective coat shall be reapplied to ground areas according to Article 420.18 at no additional cost to the Department.

Pavement corrected by removal and replacement, shall be corrected in full panel sizes.

- (b) Smoothness Assessments. Smoothness assessment for high-speed mainline pavement shall be determined as follows.

SMOOTHNESS ASSESSMENT SCHEDULE (High-Speed, PCC)	
Mainline Pavement MRI, in./mile (mm/km) ^{3/}	Assessment Per Sublot ^{1/}
≤ 45.0 (710)	+ (45 – MRI) × \$120.00 ^{2/}

> 45.0 (710) to 75.0 (1,190)	+ \$0.00
> 75.0 (1,190) to 100.0 (1,580)	- (MRI - 75) × \$45.00
> 100.0 (1,580)	- \$1,125.00

- 1/ MRI shall be in in./mile for calculation.
- 2/ The maximum incentive amount shall not exceed \$1,800.00.
- 3/ If pavement is constructed with traffic in the lane next to it, then an additional 10 in./mile will be added to the upper thresholds.”

Testing Equipment

Delete Article 1101.10 of the Standard Specifications.

80435

TEMPORARY PAVEMENT MARKING (BDE)

Effective: April 1, 2012

Revised: April 1, 2017

Revise Article 703.02 of the Standard Specifications to read:

“703.02 Materials. Materials shall be according to the following.

- (a) Pavement Marking Tape, Type I and Type III 1095.06
- (b) Paint Pavement Markings 1095.02
- (c) Pavement Marking Tape, Type IV 1095.11”

Revise the second paragraph of Article 703.05 of the Standard Specifications to read:

“Type I marking tape or paint shall be used at the option of the Contractor, except paint shall not be applied to the final wearing surface unless authorized by the Engineer for late season applications where tape adhesion would be a problem. Type III or Type IV marking tape shall be used on the final wearing surface when the temporary pavement marking will conflict with the permanent pavement marking such as on tapers, crossovers and lane shifts.”

Revise Article 703.07 of the Standard Specifications to read:

“703.07 Basis of Payment. This work will be paid for as follows.

- a) Short Term Pavement Marking. Short term pavement marking will be paid for at the contract unit price per foot (meter) for SHORT TERM PAVEMENT MARKING. Removal of short term pavement markings will be paid for at the contract unit price per square foot (square meter) for SHORT TERM PAVEMENT MARKING REMOVAL.
- b) Temporary Pavement Marking. Where the Contractor has the option of material type, temporary pavement marking will be paid for at the contract unit price per foot (meter) for TEMPORARY PAVEMENT MARKING of the line width specified, and at the contract unit price per square foot (square meter) for TEMPORARY PAVEMENT MARKING LETTERS AND SYMBOLS.

Where the Department specifies the use of pavement marking tape, the Type III or Type IV temporary pavement marking will be paid for at the contract unit price per foot (meter) for PAVEMENT MARKING TAPE, TYPE III or PAVEMENT MARKING TAPE, TYPE IV of the line width specified and at the contract unit price per square feet (square meter) for PAVEMENT MARKING TAPE, TYPE III - LETTERS AND SYMBOLS or PAVEMENT MARKING TAPE, TYPE IV – LETTERS AND SYMBOLS.

Removal of temporary pavement markings will be paid for at the contract unit price per square foot (square meter) for TEMPORARY PAVEMENT MARKING REMOVAL.

When temporary pavement marking is shown on the Standard, the cost of the temporary pavement marking and its removal will be included in the cost of the Standard.”

Add the following to Section 1095 of the Standard Specifications:

“1095.11 Pavement Marking Tape, Type IV. The temporary, preformed, patterned markings shall consist of a white or yellow tape with wet retroreflective media incorporated to provide immediate and continuing retroreflection during both wet and dry conditions. The tape shall be manufactured without the use of heavy metals including lead chromate pigments or other similar, lead-containing chemicals.

The white and yellow Type IV marking tape shall meet the Type III requirements of Article 1095.06 and the following.

- (a) Composition. The retroreflective pliant polymer pavement markings shall consist of a mixture of high-quality polymeric materials, pigments and glass beads distributed throughout its base cross-sectional area, with a layer of wet retroreflective media bonded to a durable polyurethane topcoat surface. The patterned surface shall have approximately 40% ± 10% of the surface area raised and presenting a near vertical face to traffic from any direction. The channels between the raised areas shall be substantially free of exposed beads or particles.
- (b) Retroreflectance. The white and yellow markings shall meet the following for initial dry and wet retroreflectance.
 - (1) Dry Retroreflectance. Dry retroreflectance shall be measured under dry conditions according to ASTM D 4061 and meet the values described in Article 1095.06 for Type III tape.
 - (2) Wet Retroreflectance. Wet retroreflectance shall be measured under wet conditions according to ASTM E 2177 and meet the values shown in the following table.

Wet Retroreflectance, Initial R_L

Color	R_L 1.05/88.76
White	300
Yellow	200

- (c) Color. The material shall meet the following requirements for daylight reflectance and color, when tested, using a color spectrophotometer with 45 degrees circumferential/zero degree geometry, illuminant D65, and a two degree observer angle. The color instrument shall measure the visible spectrum from 380 to 720 nm with a wavelength measurement interval and spectral bandpass of 10 nm.

Color	Daylight Reflectance %Y
White	65 minimum
*Yellow	36-59

*Shall match Federal 595 Color No. 33538 and the chromaticity limits as follows.

x	0.490	0.475	0.485	0.530
y	0.470	0.438	0.425	0.456

- (d) Skid Resistance. The surface of the markings shall provide an average minimum skid resistance of 50 BPN when tested according to ASTM E 303.
- (e) Sampling, Testing, Acceptance, and Certification. Prior to approval and use of the wet reflective, temporary, removable pavement marking tape, the manufacturer shall submit a notarized certification from an independent laboratory, together with the results of all tests, stating that the material meets the requirements as set forth herein. The certification test report shall state the lot tested, manufacturer's name, and date of manufacture.

After approval by the Department, samples and certification by the manufacturer shall be submitted for each batch used. The manufacturer shall submit a certification stating that the material meets the requirements as set forth herein and is essentially identical to the material sent for qualification. The certification shall state the lot tested, manufacturer's name, and date of manufacture.

All costs of testing (other than tests conducted by the Department) shall be borne by the manufacturer."

80298

TRAFFIC CONTROL DEVICES - CONES (BDE)

Effective: January 1, 2019

Revise Article 701.15(a) of the Standard Specifications to read:

“(a) Cones. Cones are used to channelize traffic. Cones used to channelize traffic at night shall be reflectorized; however, cones shall not be used in nighttime lane closure tapers or nighttime lane shifts.”

Revise Article 1106.02(b) of the Standard Specifications to read:

“(b) Cones. Cones shall be predominantly orange. Cones used at night that are 28 to 36 in. (700 to 900 mm) in height shall have two white circumferential stripes. If non-reflective spaces are left between the stripes, the spaces shall be no more than 2 in. (50mm) in width. Cones used at night that are taller than 36 in. (900 mm) shall have a minimum of two white and two fluorescent orange alternating, circumferential stripes with the top stripe being fluorescent orange. If non-reflective spaces are left between the stripes, the spaces shall be no more than 3 in. (75 mm) in width.

The minimum weights for the various cone heights shall be 4 lb for 18 in. (2 kg for 450 mm), 7 lb for 28 in. (3 kg for 700 mm), and 10 lb for 36 in. (5 kg for 900 mm) with a minimum of 60 percent of the total weight in the base. Cones taller than 36 in. shall be weighted per the manufacturer’s specifications such that they are not moved by wind or passing traffic.”

80409

TRAINING SPECIAL PROVISIONS (BDE) This Training Special Provision supersedes Section 7b of the Special Provision entitled “Specific Equal Employment Opportunity Responsibilities,” and is in implementation of 23 U.S.C. 140(a).

As part of the contractor’s equal employment opportunity affirmative action program, training shall be provided as follows:

The contractor shall provide on-the-job training aimed at developing full journeyman in the type of trade or job classification involved. The number of trainees to be trained under this contract will be 10 . In the event the contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided however, that the contractor shall retain the primary responsibility for meeting the training requirements imposed by this special provision. The contractor shall also insure that this Training Special Provision is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

The number of trainees shall be distributed among the work classifications on the basis of the contractor’s needs and the availability of journeymen in the various classifications within the reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to the Illinois Department of Transportation for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work who is currently enrolled or becomes enrolled in an approved program and will be reimbursed for such trainees as provided hereinafter.

Training and upgrading of minorities and women toward journeyman status is a primary objective of this Training Special Provision. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g. by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Training Special Provision. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journeyman status or in which he has been employed as a journeyman. The contractor should satisfy this requirement by including appropriate questions in the employee application or by other suitable means. Regardless of the method used the contractor’s records should document the findings in each case.

The minimum length and type of training for each classification will be as established in the training program selected by the contractor and approved by the Illinois Department of Transportation and the Federal Highway Administration. The Illinois Department of Transportation and the Federal Highway Administration shall approve a program, if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the average trainee for journeyman status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with a State apprenticeship agency recognized by the Bureau and training programs approved by not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, Bureau of Apprenticeship and Training shall also be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from the State prior to commencing work on the classification covered by the program. It is the intention of these provisions that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification may be permitted provided that significant and meaningful training is provided and approved by the Illinois Department of Transportation and the Federal Highway Administration. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

Except as otherwise noted below, the contractor will be reimbursed 80 cents per hour of training given an employee on this contract in accordance with an approved training program. As approved by the Engineer, reimbursement will be made for training of persons in excess of the number specified herein. This reimbursement will be made even though the contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement. Reimbursement for offsite training indicated above may only be made to the contractor where he does one or more of the following and the trainees are concurrently employed on a Federal-aid project; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period.

No payment shall be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyman, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirement of this Training Special Provision. It is normally expected that a trainee will begin his training on the project as soon as feasible after start of work utilizing the skill involved and remain on the project as long as training opportunities exist in his work classification or until he has completed his training program.

It is not required that all trainees be on board for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Training Special Provision if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification who are covered by this Training Special Provision.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily complete.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Training Special Provision.

METHOD OF MEASUREMENT The unit of measurement is in hours.

BASIS OF PAYMENT This work will be paid for at the contract unit price of 80 cents per hour for TRAINEES. The estimated total number of hours, unit price and total price have been included in the schedule of prices.

20338

WARM MIX ASPHALT (BDE)

Effective: January 1, 2012

Revised: April 1, 2016

Description. This work shall consist of designing, producing and constructing Warm Mix Asphalt (WMA) in lieu of Hot Mix Asphalt (HMA) at the Contractor's option. Work shall be according to Sections 406, 407, 408, 1030, and 1102 of the Standard Specifications, except as modified herein. In addition, any references to HMA in the Standard Specifications, or the special provisions shall be construed to include WMA.

WMA is an asphalt mixture which can be produced at temperatures lower than allowed for HMA utilizing approved WMA technologies. WMA technologies are defined as the use of additives or processes which allow a reduction in the temperatures at which HMA mixes are produced and placed. WMA is produced by the use of additives, a water foaming process, or combination of both. Additives include minerals, chemicals or organics incorporated into the asphalt binder stream in a dedicated delivery system. The process of foaming injects water into the asphalt binder stream, just prior to incorporation of the asphalt binder with the aggregate.

Approved WMA technologies may also be used in HMA provided all the requirements specified herein, with the exception of temperature, are met. However, asphalt mixtures produced at temperatures in excess of 275 °F (135 °C) will not be considered WMA when determining the grade reduction of the virgin asphalt binder grade.

Equipment.

Revise the first paragraph of Article 1102.01 of the Standard Specifications to read:

"1102.01 Hot-Mix Asphalt Plant. The hot-mix asphalt (HMA) plant shall be the batch-type, continuous-type, or dryer drum plant. The plants shall be evaluated for prequalification rating and approval to produce HMA according to the current Bureau of Materials and Physical Research Policy Memorandum, "Approval of Hot-Mix Asphalt Plants and Equipment". Once approved, the Contractor shall notify the Bureau of Materials and Physical Research to obtain approval of all plant modifications. The plants shall not be used to produce mixtures concurrently for more than one project or for private work unless permission is granted in writing by the Engineer. The plant units shall be so designed, coordinated and operated that they will function properly and produce HMA having uniform temperatures and compositions within the tolerances specified. The plant units shall meet the following requirements."

Add the following to Article 1102.01(a) of the Standard Specifications.

"(11) Equipment for Warm Mix Technologies.

- a. Foaming. Metering equipment for foamed asphalt shall have an accuracy of ± 2 percent of the actual water metered. The foaming control system shall be electronically interfaced with the asphalt binder meter.

- b. Additives. Additives shall be introduced into the plant according to the supplier's recommendations and shall be approved by the Engineer. The system for introducing the WMA additive shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production and batch sizes."

Mix Design Verification.

Add the following to Article 1030.04 of the Standard Specifications.

"(e) Warm Mix Technologies.

- (1) Foaming. WMA mix design verification will not be required when foaming technology is used alone (without WMA additives). However, the foaming technology shall only be used on HMA designs previously approved by the Department.
- (2) Additives. WMA mix designs utilizing additives shall be submitted to the Engineer for mix design verification."

Construction Requirements.

Revise the second paragraph of Article 406.06(b)(1) of the Standard Specifications to read:

"The HMA shall be delivered at a temperature of 250 to 350 °F (120 to 175 °C).
WMA shall be delivered at a minimum temperature of 215 °F (102 °C)."

Basis of Payment.

This work will be paid at the contract unit price bid for the HMA pay items involved. Anti-strip will not be paid for separately, but shall be considered as included in the cost of the work.

80288

WEEKLY DBE TRUCKING REPORTS (BDE)

Effective: June 2, 2012

| Revised: April 2, 2015

| The Contractor shall submit a weekly report of Disadvantaged Business Enterprise (DBE) trucks hired by the Contractor or subcontractors (i.e. not owned by the Contractor or subcontractors) that are used for DBE goal credit.

| The report shall be submitted to the Engineer on Department form "SBE 723" within ten business days following the reporting period. The reporting period shall be Monday through Sunday for each week reportable trucking activities occur.

Any costs associated with providing weekly DBE trucking reports shall be considered as included in the contract unit prices bid for the various items of work involved and no additional compensation will be allowed.

80302

WORK ZONE TRAFFIC CONTROL DEVICES (BDE)

Effective: March 2, 2020

Add the following to Article 701.03 of the Standard Specifications:

“(q) Temporary Sign Supports 1106.02”

Revise the third paragraph of Article 701.14 of the Standard Specifications to read:

“For temporary sign supports, the Contractor shall provide a FHWA eligibility letter for each device used on the contract. The letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device. The signs shall be supported within 20 degrees of vertical. Weights used to stabilize signs shall be attached to the sign support per the manufacturer’s specifications.”

Revise the first paragraph of Article 701.15 of the Standard Specifications to read:

“**701.15 Traffic Control Devices.** For devices that must meet crashworthiness standards, the Contractor shall provide a manufacturer’s self-certification or a FHWA eligibility letter for each Category 1 device and a FHWA eligibility letter for each Category 2 and Category 3 device used on the contract. The self-certification or letter shall provide information for the set-up and use of the device as well as a detailed drawing of the device.”

Revise the first six paragraphs of Article 1106.02 of the Standard Specifications to read:

“**1106.02 Devices.** Work zone traffic control devices and combinations of devices shall meet crashworthiness standards for their respective categories. The categories are as follows.

Category 1 includes small, lightweight, channelizing and delineating devices that have been in common use for many years and are known to be crashworthy by crash testing of similar devices or years of demonstrable safe performance. These include cones, tubular markers, plastic drums, and delineators, with no attachments (e.g. lights). Category 1 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 1 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 2 includes devices that are not expected to produce significant vehicular velocity change but may otherwise be hazardous. These include vertical panels with lights, barricades, temporary sign supports, and Category 1 devices with attachments (e.g. drums with lights). Category 2 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 2 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2024.

Category 3 includes devices that are expected to cause significant velocity changes or other potentially harmful reactions to impacting vehicles. These include crash cushions (impact

attenuators), truck mounted attenuators, and other devices not meeting the definitions of Category 1 or 2. Category 3 devices manufactured after December 31, 2019 shall be MASH-16 compliant. Category 3 devices manufactured on or before December 31, 2019, and compliant with NCHRP 350 or MASH 2009, may be used on contracts let before December 31, 2029. Category 3 devices shall be crash tested for Test Level 3 or the test level specified.

Category 4 includes portable or trailer-mounted devices such as arrow boards, changeable message signs, temporary traffic signals, and area lighting supports. It is preferable for Category 4 devices manufactured after December 31, 2019 to be MASH-16 compliant; however, there are currently no crash tested devices in this category, so it remains exempt from the NCHRP 350 or MASH compliance requirement.

For each type of device, when no more than one MASH-16 compliant is available, an NCHRP 350 or MASH-2009 compliant device may be used, even if manufactured after December 31, 2019.”

Revise Articles 1106.02(g), 1106.02(k), and 1106.02(l) to read:

“(g) Truck Mounted/Trailer Mounted Attenuators. The attenuator shall be approved for use at Test Level 3. Test Level 2 may be used for normal posted speeds less than or equal to 45 mph.

(k) Temporary Water Filled Barrier. The water filled barrier shall be a lightweight plastic shell designed to accept water ballast and be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings.

(l) Movable Traffic Barrier. The movable traffic barrier shall be on the Department’s qualified product list.

Shop drawings shall be furnished by the manufacturer and shall indicate the deflection of the barrier as determined by acceptance testing; the configuration of the barrier in that test; and the vehicle weight, velocity, and angle of impact of the deflection test. The Engineer shall be provided one copy of the shop drawings. The barrier shall be capable of being moved on and off the roadway on a daily basis.”

80427

WORKING DAYS (BDE)

Effective: January 1, 2002

The Contractor shall complete the work within 235 working days.

80071

CLEANING AND PAINTING EXISTING STEEL STRUCTURES

Effective: October 2, 2001

Revised: October 23, 2020

Description. This work shall consist of the preparation of all designated metal surfaces by the method(s) specified on the plans. This work also includes the painting of those designated surfaces. This work also includes caulking locations designated on the plans and painting with the paint system(s) specified on the plans. The Contractor shall furnish all materials, equipment, labor, and other essentials necessary to accomplish this work and all other work described herein and as directed by the Engineer.

Materials. All materials to be used on an individual structure shall be produced by the same manufacturer.

The Bureau of Materials and Physical Research has established a list of all products that have met preliminary requirements. Each batch of material, except for the penetrating sealer, shall be tested and assigned a MISTIC approval number before use. The specified colors shall be produced in the coating manufacturer's facility. Tinting of the coating after it leaves the manufacturer's facility is not allowed.

The paint materials shall meet the following requirements of the Standard Specification and as noted below:

<u>Item</u>	<u>Article</u>
(a) Waterborne Acrylic	1008.04
(b) Aluminum Epoxy Mastic	1008.03
(c) Organic Zinc Rich Primer	1008.05
(d) Epoxy/ Aliphatic Urethane	1008.05
(e) Penetrating Sealer (Note 1)	
(f) Moisture Cured Zinc Rich Urethane Primer (Note 2)	
(g) Moisture Cured Aromatic/Aliphatic Urethane (Note 2)	
(h) Moisture Cured Penetrating Sealer (Note 3)	
(i) Caulk (Polyurethane Joint Sealant)	1050.04

Note 1: The Epoxy Penetrating Sealer shall be a cross-linked multi component sealer. The sealer shall have the following properties:

- (a) The volume solids shall be 98 percent (plus or minus 2 percent).
- (b) Shall be clear or slightly tinted color.

Note 2: These material requirements shall be according to the Special Provision for the Moisture Cured Urethane Paint System.

Note 3: The Moisture Cured Penetrating Sealer manufacturer's certification will be required.

Submittals. The Contractor shall submit for Engineer review and acceptance, the following plans and information for completing the work. The submittals shall be provided within 30 days of execution of the contract unless given written permission by the Engineer to submit them at a later date. Work cannot proceed until the submittals are accepted by the Engineer. Details for each of the plans are presented within the body of this specification.

- a) Contractor/Personnel Qualifications. Evidence of Contractor qualifications and the names and qualifications/experience/training of the personnel managing and implementing the Quality Control program and conducting the quality control tests, and certifications for the CAS (Coating Application Specialists) on SSPC-QP1 and QP2 projects.
- b) Quality Control (QC) Program. The QC Program shall identify the following; the instrumentation that will be used, a schedule of required measurements and observations, procedures for correcting unacceptable work, and procedures for improving surface preparation and painting quality as a result of quality control findings. The program shall incorporate at a minimum, the IDOT Quality Control Daily Report form, or a Contractor form (paper or electronic) that provides equivalent information.
- c) Inspection Access Plan. The inspection access plan for use by Contractor QC personnel for ongoing inspections and by the Engineer during Quality Assurance (QA) observations.
- d) Surface Preparation/Painting Plan. The surface preparation/painting plan shall include the methods of surface preparation and type of equipment to be utilized for washing, hand/power tool cleaning, removal of rust, mill scale, paint or foreign matter, abrasive blast or water jetting, and remediation of chloride. If detergents, additives, or inhibitors are incorporated into the water, the Contractor shall include the names of the materials and Safety Data Sheets (SDS). The Contractor shall identify the solvents proposed for solvent cleaning together with SDS.

If cleaning and painting over existing galvanized surfaces are specified, the plan shall address surface preparation, painting, and touch up/repair of the galvanized surfaces.

The plan shall also include the methods of coating application and equipment to be utilized.

If the Contractor proposes to heat or dehumidify the containment, the methods and equipment proposed for use shall be included in the Plan for the Engineer's consideration.

- e) Paint Manufacturer Certifications and Letters. When a sealer is used, the Contractor shall provide the manufacturer's certification of compliance with IDOT testing requirements listed under "Materials" above. A certification regarding the compatibility of the sealer with the specified paint system shall also be included.

When rust inhibitors are used, the Contractor shall provide a letter from the coating manufacturer indicating that the inhibitor is compatible with, and will not adversely affect the performance of the coating system.

If the use of a chemical soluble salt remover is proposed by the Contractor, provide a letter from the coating manufacturer indicating that the material will not adversely affect the performance of the coating system.

The paint manufacturer's most recent application and thinning instructions, SDS and product data sheets shall be provided, with specific attention drawn to storage temperatures, and the temperatures of the material, surface and ambient air at the time of application.

A letter or written instructions from the coating manufacturer shall be provided indicating the length of time that each coat must be protected from cold or inclement weather (e.g., exposure to rain) during its drying period, the maximum recoat time for each coat, and the steps necessary to prepare each coat for overcoating if the maximum recoat time is exceeded.

- f) Abrasives. Abrasives to be used for abrasive blast cleaning, including SDS. For expendable abrasives, the Contractor shall provide certification from the abrasive supplier that the abrasive meets the requirements of SSPC-AB1. For steel grit abrasives, the certification shall indicate that the abrasive meets the requirements of SSPC-AB3.
- g) Protective Coverings. Plan for containing or controlling paint debris (droplets, spills, overspray, etc.). Any tarpaulins or protective coverings proposed for use shall be fire retardant. For submittal requirements involving the containment used to remove lead paint, the Contractor shall refer to Special Provision for Containment and Disposal of Lead Paint Cleaning Residues.
- h) Progress Schedule. Progress schedule shall be submitted per Article 108.02 and shall identify all major work items (e.g., installation of rigging/containment, surface preparation, and coating application).

When the Engineer accepts the submittals, the Contractor will receive written notification. The Contractor shall not begin any paint removal work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, State, or Local regulations and this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Contractor Qualifications. Unless indicated otherwise on the contract plans, for non lead abatement projects, the painting Contractor shall possess current SSPC–QP1 certification. Unless indicated otherwise on the plans, for lead abatement projects the Contractor shall also possess current SSPC-QP2 certification. The Contractor shall maintain certified status throughout the duration of the painting work under the contract. The Department reserves the right to accept Contractors documented to be currently enrolled in the SSPC-QP7, Painting Contractor Introductory Program, Category 2, in lieu of the QP certifications noted above.

Quality Control (QC) Inspections. The Contractor shall perform first line, in process QC inspections. The Contractor shall implement the submitted and accepted QC Program to ensure that the work accomplished complies with these specifications. The designated Quality Control inspector shall be onsite full time during any operations that affect the quality of the coating system (e.g., surface preparation and chloride remediation, coating mixing and application, and evaluations between coats and upon project completion). The Contractor shall use the IDOT Quality Control Daily Report form to record the results of quality control tests. Alternative forms (paper or electronic) will be allowed provided they furnish equivalent documentation as the IDOT form, and they are accepted as part of the QC Program submittal. The completed reports shall be turned into the Engineer before work resumes the following day. The Engineer or designated representative will sign the report. The signature is an acknowledgment that the report has been received, but should not be construed as an agreement that any of the information documented therein is accurate.

Contractor QC inspections shall include, but not be limited to the following:

- Suitability of protective coverings and the means employed to control project debris and paint spills, overspray, etc.
- Ambient conditions
- Surface preparation (solvent cleaning, pressure washing including chalk tests, hand/power tool or abrasive blast cleaning, etc.)
- Chloride remediation
- Coating application (specified materials, mixing, thinning, and wet/dry film thickness)
- Recoat times and cleanliness between coats
- Coating continuity and coverage (freedom from runs, sags, overspray, dryspray, pinholes, shadow-through, skips, misses, etc.)

The personnel managing the Contractor's QC Program shall possess a minimum classification of Society of Protective Coatings (SSPC) BCI certified, National Association of Corrosion Engineers (NACE) Coating Inspector Level 2 - Certified, and shall provide evidence of successful inspection of 3 bridge projects of similar or greater complexity and scope that have been completed in the last 2 years. Copies of the certification and experience shall be provided. References for experience shall be provided and shall include the name, address, and telephone number of a contact person employed by the bridge owner.

The personnel performing the QC tests shall be trained in coatings inspection and the use of the testing instruments. Documentation of training shall be provided. The QC personnel shall not perform hands on surface preparation or painting activities. Painters shall perform wet film thickness measurements, with QC personnel conducting random spot checks of the wet film. The Contractor shall not replace the QC personnel assigned to the project without advance notice to the Engineer, and acceptance of the replacement(s), by the Engineer.

The Contractor shall supply all necessary equipment with current calibration certifications to perform the QC inspections. Equipment shall include the following at a minimum:

- Sling psychrometer or digital psychrometer for the measurement of dew point and relative humidity, together with all necessary weather bureau tables or psychrometric charts. In the event of a conflict between readings with the sling psychrometer and the digital psychrometer, the readings with the sling psychrometer shall prevail.
- Surface temperature thermometer
- SSPC Visual Standards VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning; SSPC-VIS 3, Visual Standard for Power and Hand-Tool Cleaned Steel; SSPC-VIS 4, Guide and Reference Photographs for Steel Prepared by Water Jetting, and/or SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning, as applicable.
- Test equipment for determining abrasive cleanliness (oil content and water-soluble contaminants) according to SSPC abrasive specifications AB1, AB2, and AB3.
- Commercially available putty knife of a minimum thickness of 40 mils (1mm) and a width between 1 and 3 in. (25 and 75 mm). Note that the putty knife is only required for projects in which the existing coating is being feathered and tested with a dull putty knife.
- Testex Press-O-Film Replica Tape and Micrometer compliant with Method C of ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel, or digital profile depth micrometer compliant with ASTM D4417, Method B. In the event of a conflict between measurements with the two instruments on abrasive blast cleaned steel, the results with the Testex Tape shall prevail. Note that for measuring the profile of steel power tool cleaned to SSPC-SP15, Commercial Grade Power Tool Cleaning, the digital profile depth micrometer shall be used.
- Bresle Cell Kits or CHLOR*TEST kits for chloride determinations, or equivalent
- Wet Film Thickness Gage
- Blotter paper for compressed air cleanliness checks
- Type 2 Electronic Dry Film Thickness Gage per SSPC - PA2, Procedure for Determining Conformance to Dry Coating Thickness Requirements
- Standards for verifying the accuracy of the dry film thickness gage
- Light meter for measuring light intensity during paint removal, painting, and inspection activities
- All applicable ASTM and SSPC Standards used for the work (reference list attached)

The accuracy of the instruments shall be verified by the Contractor's personnel according to the equipment manufacturer's recommendations and the Contractor's QC Program. All inspection equipment shall be made available to the Engineer for QA observations on an as needed basis.

Hold Point Notification. Specific inspection items throughout this specification are designated as Hold Points. Unless other arrangements are made at the project site, the Contractor shall provide the Engineer with a minimum 4-hour notification before a Hold Point inspection will be reached. If the 4-hour notification is provided and the Work is ready for inspection at that time, the Engineer will conduct the necessary observations. If the Work is not ready at the appointed time, unless other arrangements are made, an additional 4-hour notification is required. Permission to proceed beyond a Hold Point without a QA inspection will be granted solely at the discretion of the Engineer, and only on a case by case basis.

Quality Assurance (QA) Observations. The Engineer will conduct QA observations of any or all phases of the work. The presence or activity of Engineer observations in no way relieves the Contractor of the responsibility to provide all necessary daily QC inspections of his/her own and to comply with all requirements of this Specification.

The Engineer has the right to reject any work that was performed without adequate provision for QA observations.

Inspection Access and Lighting. The Contractor shall facilitate the Engineer's observations as required, including allowing ample time to view the work. The Contractor shall furnish, erect and move scaffolding or other mechanical equipment to permit close observation of all surfaces to be cleaned and painted. This equipment shall be provided during all phases of the work. Examples of acceptable access structures include:

- Mechanical lifting equipment, such as, scissor trucks, hydraulic booms, etc.
- Platforms suspended from the structure comprised of trusses or other stiff supporting members and including rails and kick boards.
- Simple catenary supports are permitted only if independent lifelines for attaching a fall arrest system according to Occupational Safety and Health Administration (OSHA) regulations are provided.

When the surface to be inspected is more than 6 ft. (1.8 m) above the ground or water surface, and fall prevention is not provided (e.g., guardrails are not provided), the Contractor shall provide the Engineer with a safety harness and a lifeline according to OSHA regulations. The lifeline and attachment shall not direct the fall into oncoming traffic. The Contractor shall provide a method of attaching the lifeline to the structure independent of the inspection facility or any support of the platform. When the inspection facility (e.g., platform) is more than 2 1/2 ft. (800 mm) above the ground, the Contractor shall provide an approved means of access onto the platform.

The Contractor shall provide artificial lighting in areas both inside and outside the containment where natural light is inadequate, as determined by the Engineer, to allow proper cleaning, inspection, and painting. Illumination for inspection shall be at least 30 foot-candles (325 LUX). Illumination for cleaning and painting, including the working platforms, access and entryways shall be at least 20 foot-candles (215 LUX). General work area illumination outside the containment shall be employed at the discretion of the Engineer and shall be at least 5 foot-

candles. The exterior lighting system shall be designed and operated so as to avoid glare that interferes with traffic, workers, and inspection personnel.

Surface Preparation and Painting Equipment. All cleaning and painting equipment shall include gages capable of accurately measuring fluid and air pressures and shall have valves capable of regulating the flow of air, water or paint as recommended by the equipment manufacturer. The equipment shall be maintained in proper working order.

Diesel or gasoline powered equipment shall be positioned or vented in a manner to prevent deposition of combustion contaminants on any part of the structure.

Hand tools, power tools, pressure washing, water jetting, abrasive blast cleaning equipment, brushes, rollers, and spray equipment shall be of suitable size and capacity to perform the work required by this specification. All power tools shall be equipped with vacuums and High Efficiency Particulate Air (HEPA) filtration. Appropriate filters, traps and dryers shall be provided for the compressed air used for abrasive blast cleaning and conventional spray application. Paint pots shall be equipped with air operated continuous mixing devices unless prohibited by the coating manufacturer.

Test Sections. Prior to surface preparation, the Contractor shall prepare a test section(s) on each structure to be painted in a location(s) which the Engineer considers to be representative of the existing surface condition and steel type for the structure as a whole. More than one test section may be needed to represent the various design configurations of the structure. The purpose of the test section(s) is to demonstrate the use of the tools and degree of cleaning required (cleanliness and profile) for each method of surface preparation that will be used on the project. Each test section shall be approximately 10 sq. ft. (0.93 sq m). The test section(s) shall be prepared using the same equipment, materials and procedures as the production operations. The Contractor shall prepare the test section(s) to the specified level of cleaning according to the appropriate SSPC visual standards, modified as necessary to comply with the requirements of this specification. The written requirements of the specification prevail in the event of a conflict with the SSPC visual standards. Only after the test section(s) have been approved shall the Contractor proceed with surface preparation operations. Additional compensation will not be allowed the Contractor for preparation of the test section(s).

For the production cleaning operations, the specifications and written definitions, the test section(s), and the SSPC visual standards shall be used in that order for determining compliance with the contractual requirements.

Protective Coverings and Damage. All portions of the structure that could be damaged by the surface preparation and painting operations (e.g., utilities), including any sound paint that is allowed to remain according to the contract documents, shall be protected by covering or shielding. Tarpaulins drop cloths, or other approved materials shall be employed. The Contractor shall comply with the provisions of the Illinois Environmental Protection Act. Paint drips, spills, and overspray are not permitted to escape into the air or onto any other surfaces or surrounding property not intended to be painted. Containment shall be used to control paint drips, spills, and overspray, and shall be dropped and all equipment secured when sustained

wind speeds of 40 mph (64 kph) or greater occur, unless the containment design necessitates action at lower wind speeds. The contractor shall evaluate project-specific conditions to determine the specific type and extent of containment needed to control the paint emissions and shall submit a plan for containing or controlling paint debris (droplets, spills, overspray, etc.) to the Engineer for acceptance prior to starting the work. Acceptance by the Engineer shall not relieve the Contractor of their ultimate responsibility for controlling paint debris from escaping the work zone.

When the protective coverings need to be attached to the structure, they shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing. When removing coatings containing lead the containment and disposal of the residues shall be as specified in the Special Provision for Containment and Disposal of Lead Paint Cleaning Residues contained elsewhere in this Contract. When removing coatings not containing lead the containment and disposal of the residues shall be as specified in the Special Provision for Containment and Disposal of Non-Lead Paint Cleaning Residues contained elsewhere in this Contract.

The Contractor shall be responsible for any damage caused to persons, vehicles, or property, except as indemnified by the Response Action Contractor Indemnification Act. Whenever the intended purposes of the controls or protective devices used by the Contractor are not being accomplished, work shall be immediately suspended until corrections are made. Damage to vehicles or property shall be repaired by the Contractor at the Contractor's expense. Painted surfaces damaged by any Contractor's operation shall be repaired, removed and/or repainted, as directed by the Engineer, at the Contractor's expense.

Weather Conditions. Surfaces to be painted after cleaning shall remain free of moisture and other contaminants. The Contractor shall control his/her operations to insure that dust, dirt, or moisture do not come in contact with surfaces cleaned or painted that day.

- a) The surface temperature shall be at least 5°F (3°C) above the dew point during final surface preparation operations. The manufacturers' published literature shall be followed for specific temperature, dew point, and humidity restrictions during the application of each coat.
- b) If the Contractor proposes to control the weather conditions inside containment, proposed methods and equipment for heating and/or dehumidification shall be included in the work plans for the Engineer's consideration. Only indirect fired heating equipment shall be used to prevent the introduction of moisture and carbon monoxide into the containment. The heating unit(s) shall be ventilated to the outside of the containment. Any heating/dehumidification proposals accepted by the Engineer shall be implemented at no additional cost to the department.
- c) Cleaning and painting shall be done between April 15 and October 31 unless authorized otherwise by the Engineer in writing.

The Contractor shall monitor temperature, dew point, and relative humidity every 4 hours during surface preparation and coating application in the specific areas where the work is being performed. The frequency of monitoring shall increase if weather conditions are changing. If the weather conditions after application and during drying are forecast to be outside the acceptable limits established by the coating manufacturer, coating application shall not proceed. If the weather conditions are forecast to be borderline relative to the limits established by the manufacturer, monitoring shall continue at a minimum of 4-hour intervals throughout the drying period. The Engineer has the right to reject any work that was performed, or drying that took place, under unfavorable weather conditions. Rejected work shall be removed, recleaned, and repainted at the Contractor's expense.

Compressed Air Cleanliness. Prior to using compressed air for abrasive blast cleaning, blowing down the surfaces, and painting with conventional spray, the Contractor shall verify that the compressed air is free of moisture and oil contamination according to the requirements of ASTM D 4285. The tests shall be conducted at least one time each shift for each compressor system in operation. If air contamination is evident, the Contractor shall change filters, clean traps, add moisture separators or filters, or make other adjustments as necessary to achieve clean, dry air. The Contractor shall also examine the work performed since the last acceptable test for evidence of defects or contamination caused by the compressed air. Effected work shall be repaired at the Contractor's expense.

Low Pressure Water Cleaning and Solvent Cleaning (HOLD POINT). The Contractor shall notify the Engineer 24 hours in advance of beginning surface preparation operations.

- a) Water Cleaning of Lead Containing Coatings Prior to Overcoating. Prior to initiating any mechanical cleaning such as hand/power tool cleaning on surfaces that are painted with lead, all surfaces to be prepared and painted, and the tops of pier and abutment caps shall be washed. Washing is not required if the surfaces will be prepared by water jetting.

Washing shall involve the use of potable water at a minimum of 1000 psi (7 MPa) and less than 5000 psi (34 MPa) according to "Low Pressure Water Cleaning" of SSPC-SP WJ-4. There are no restrictions on the presence of flash rusting of bare steel after cleaning. Paint spray equipment shall not be used to perform the water cleaning. The cleaning shall be performed in such a manner as to remove dust, dirt, chalk, insect and animal nests, bird droppings, loose coating, loose mill scale, loose rust and other corrosion products, and other foreign matter. Water cleaning shall be supplemented with scrubbing as necessary to remove the surface contaminants. . The water, debris, and any loose paint removed by water cleaning shall be collected for proper disposal. The washing shall be completed no more than 2 weeks prior to surface preparation.

If detergents or other additives are added to the water, the detergents/additives shall be included in the submittals and not used until accepted by the Engineer. When detergents or additives are used, the surface shall be rinsed with potable water before the detergent water dries.

After washing has been accepted by the Engineer, all traces of asphaltic cement, oil, grease, diesel fuel deposits, and other soluble contaminants which remain on the steel surfaces to be painted shall be removed by solvent cleaning according to SSPC – SP1, supplemented with scraping (e.g., to remove large deposits of asphaltic cement) as required. The solvent(s) used for cleaning shall be compatible with the existing coating system. The Contractor shall identify the proposed solvent(s) in the submittals. If the existing coating is softened, wrinkled, or shows other signs of attack from the solvents, the Contractor shall immediately discontinue their use. The name and composition of replacement solvents, together with MSDS, shall be submitted for Engineer acceptance prior to use.

Under no circumstances shall subsequent hand/power tool cleaning or abrasive blast cleaning be performed in areas containing surface contaminants or in areas where the Engineer has not accepted the washing and solvent cleaning. Surfaces prepared by hand/power tool cleaning or abrasive blast cleaning without approval of the washing and solvent cleaning may be rejected by the Engineer. Rejected surfaces shall be recleaned with both solvent and the specified mechanical means at the Contractor's expense.

After all washing and mechanical cleaning are completed, representative areas of the existing coating shall be tested to verify that the surface is free of chalk and other loose surface debris or foreign matter. The testing shall be performed according to ASTM D4214. Cleaning shall continue until a chalk rating of 6 or better is achieved in every case.

- b) Water Cleaning of Non-Lead Coatings Prior to Overcoating. Thoroughly clean the surfaces according to the steps defined above for "Water Cleaning of Lead Containing Coatings Prior to Overcoating." The wash water does not need to be collected, but paint chips, insect and animal nests, bird droppings and other foreign matter shall be collected for proper disposal. If the shop primer is inorganic zinc, the chalk rating does not apply. All other provisions are applicable.
- c) Water Cleaning/Debris Removal Prior to Total Coating Removal. When total coating removal is specified, water cleaning of the surface prior to coating removal is not required by this specification and is at the option of the Contractor. If the Contractor chooses to use water cleaning, the above provisions for water cleaning of lead and non-lead coatings apply as applicable, including collection and disposal of the waste.

Whether or not the surfaces are pre-cleaned using water, the tops of the pier caps and abutments shall be cleaned free of dirt, paint chips, insect and animal nests, bird droppings and other foreign matter and the debris collected for proper disposal. Cleaning can be accomplished by wet or dry methods.

Prior to mechanical cleaning, oil, grease, and other soluble contaminants on bare steel or rusted surfaces shall be removed by solvent cleaning according to SSPC-SP1.

- d) **Water Cleaning Between Coats.** When foreign matter has accumulated on a newly applied coat, washing and scrubbing shall be performed prior to the application of subsequent coats. The water does not need to be collected unless it contacts existing lead containing coatings.

Laminar and Stratified Rust. All laminar and stratified rust that has formed on the existing steel surfaces shall be removed. Pack rust formed along the perimeter of mating surfaces of connected plates or shapes of structural steel shall be removed to the extent feasible without mechanically detaching the mating surface. When caulking is specified, all rust shall be removed to a surface depth as directed by the Engineer to accommodate the approved sealant. Any pack rust remaining after cleaning the mating surfaces shall be tight and intact when examined using a dull putty knife. The tools used to remove these corrosion products shall be identified in the submittals and accepted by the Engineer. If the surface preparation or removal of rust results in nicks or gouges in the steel, the work shall be suspended, and the damaged areas repaired to the satisfaction of the Engineer, at the Contractor's expense. The Contractor shall also demonstrate that he/she has made the necessary adjustments to prevent a reoccurrence of the damage prior to resuming work. If surface preparation reveals holes or section loss, or creates holes in the steel, the Contractor shall notify the Engineer. Whenever possible, the Department will require that the primer be applied to preserve the area, and allow work to proceed, with repairs and touch up performed at a later date.

Surface Preparation (HOLD POINT). One or more of the following methods of surface preparation shall be used as specified on the plans. When a method of surface preparation is specified, it applies to the entire surface, including areas that may be concealed by the containment connection points. In each case, as part of the surface preparation process, soluble salts shall be remediated as specified under "Soluble Salt Remediation." The Contractor shall also note that the surface of the steel beneath the existing coating system may contain corrosion and/or mill scale. Removal of said corrosion and/or mill scale, when specified, shall be considered included in this work and no extra compensation will be allowed.

When a particular cleaning method is specified for use in distinct zones on the bridge, the cleaning shall extend into the existing surrounding paint until a sound border is achieved. The edge of the existing paint is considered to be sound and intact after cleaning if it cannot be lifted by probing the edge with a dull putty knife. The sound paint shall be feathered for a minimum of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared steel and the existing coatings. Sanders with vacuum attachments, which have been approved by the Engineer, shall be used as necessary to accomplish the feathering.

- a) **Limited Access Areas:** A best effort with the specified methods of cleaning shall be performed in limited access areas such as the backsides of rivets inside built up box members. The equipment being used for the majority of the cleaning may need to be supplemented with other commercially available equipment, such as angle nozzles, to properly clean the limited access areas. The acceptability of the best effort cleaning in these areas is at the sole discretion of the Engineer.

- b) **Near-White Metal Blast Cleaning:** This surface preparation shall be accomplished according to the requirements of Near-White Metal Blast Cleaning SSPC-SP 10. Unless otherwise specified in the contract, the designated surfaces shall be prepared by dry abrasive blast cleaning, wet abrasive blast cleaning, or water jetting with abrasive injection. A Near-White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining.

Random staining shall be limited to no more than 5 percent of each 9 sq. in. (58 sq. cm) of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. With the exception of crevices as defined below, surface discoloration is considered to be a residue that must be removed, rather than a stain, if it possesses enough mass or thickness that it can be removed as a powder or in chips when scraped with a pocketknife.

A surface profile shall be created on the steel as defined later under "Surface Profile."

At the discretion of the Engineer, after a best effort cleaning, slight traces of existing coating may be permitted to remain within crevices such as those created between the steel and rivets or bolts/washers/nuts, and between plates. When traces of coating are permitted to remain, the coating shall be tightly bonded when examined by probing with a dull putty knife. The traces of coating shall be confined to the bottom portion of the crevices only, and shall not extend onto the surrounding steel or plate or onto the outer surface of the rivets or bolts. Pitted steel is excluded from exemption considerations and shall be cleaned according to SSPC-SP10.

If hackles or slivers are visible on the steel surface after cleaning, the Contractor shall remove them by grinding followed by reblast cleaning. At the discretion of the Engineer, the use of power tools to clean the localized areas after grinding, and to establish a surface profile acceptable to the coating manufacturer, can be used in lieu of blast cleaning.

If the surfaces are prepared using wet abrasive methods, attention shall be paid to tightly configured areas to assure that the preparation is thorough. After surface preparation is completed, the surfaces, surrounding steel, and containment materials/scaffolding shall be rinsed to remove abrasive dust and debris. Potable water shall be used for all operations. An inhibitor shall be added to the supply water and/or rinse water to prevent flash rusting. With the submittals, the Contractor shall provide a sample of the proposed inhibitor together with a letter from the coating manufacturer indicating that the inhibitor is suitable for use with their products and that the life of the coating system will not be reduced due to the use of the inhibitor. The surfaces shall be allowed to completely dry before the application of any coating.

- c) **Commercial Grade Power Tool Cleaning:** This surface preparation shall be accomplished according to the requirements of SSPC-SP15. The designated surfaces shall be completely cleaned with power tools. A Commercial Grade Power Tool Cleaned

surface, when viewed without magnification, is free of all visible oil, grease, dirt, rust, coating, oxides, mill scale, corrosion products, and other foreign matter, except for staining. In previously pitted areas, slight residues of rust and paint may also be left in the bottoms of pits.

Random staining shall be limited to no more than 33 percent of each 9 sq. in. (58 sq. cm) of surface area. Allowable staining may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Surface discoloration is considered to be a residue that must be removed, rather than a stain, if it possesses enough mass or thickness that it can be removed as a powder or in chips when scraped with a pocketknife.

A surface profile shall be created on the steel as defined later under "Surface Profile."

At the Contractor's option, Near-White Metal Blast Cleaning may be substituted for Power Tool Cleaning – Commercial Grade, as long as containment systems appropriate for abrasive blast cleaning are utilized and there is no additional cost to the Department.

- d) Power Tool Cleaning – Modified SP3: This surface preparation shall be accomplished according to the requirements of SSPC-SP3, Power Tool Cleaning except as modified as follows. The designated surfaces shall be cleaned with power tools. A power tool cleaned surface shall be free of all loose rust, loose mill scale, loose and peeling paint, and loose rust that is bleeding through and/or penetrating the coating. All locations of visible corrosion and rust bleed, exposed or lifting mill scale, and lifting or loose paint shall be prepared using the power tools, even if the material is tight.

Upon completion of the cleaning, rust, rust bleed, mill scale and surrounding paint are permitted to remain if they can not be lifted using a dull putty knife.

- e) Power Tool Cleaning of Shop Coated Steel: When shop-coated steel requires one or more coats to be applied in the field, the surface of the shop coating shall be cleaned as specified under "Water Cleaning of Non-Lead Coatings Prior to Overcoating." If the damage is to a fully applied shop system, water cleaning is not required unless stipulated in the contract. Damaged areas of shop coating shall be spot cleaned according to Power Tool Cleaning - Modified SSPC-SP3. If the damage extends to the substrate, spot cleaning shall be according to SSPC-SP15. The edges of the coating surrounding all spot repairs shall be feathered.

- f) Galvanized Surfaces: If galvanized surfaces are specified to be painted, they shall be prepared by brush-off blast cleaning in accordance with SSPC-SP 16 or by using proprietary solutions that are specifically designed to clean and etch (superficially roughen) the galvanized steel for painting. If cleaning and etching solutions are selected, the Contractor shall submit the manufacturer's technical product literature and SDS for Engineer's review and written acceptance prior to use.

Abrasives. Unless otherwise specified in the contract, when abrasive blast cleaning is specified, it shall be performed using either expendable abrasives (other than silica sand) or recyclable steel grit abrasives. Expendable abrasives shall be used one time and disposed of. Abrasive suppliers shall certify that the expendable abrasives meet the requirements of SSPC-AB1 and that recyclable steel grit abrasives meet SSPC-AB3. Tests to confirm the cleanliness of new abrasives (oil and water-soluble contamination) shall be performed by the Contractor according to the requirements and frequencies of SSPC-AB1 and SSPC-AB3, as applicable. On a daily basis, the Contractor shall verify that recycled abrasives are free of oil and water-soluble contamination by conducting the tests specified in SSPC-AB2.

All surfaces prepared with abrasives not meeting the SSPC-AB1, AB2, or AB3 requirements, as applicable, shall be solvent cleaned or low-pressure water cleaned as directed by the Engineer, and reblast cleaned at the Contractor's expense.

Surface Profile (HOLD POINT). The abrasives used for blast cleaning shall have a gradation such that the abrasive will produce a uniform surface profile of 1.5 to 4.5 mils (38 to 114 microns). If the profile requirements of the coating manufacturer are more restrictive, advise the Engineer and comply with the more restrictive requirements. For recycled abrasives, an appropriate operating mix shall be maintained in order to control the profile within these limits.

The surface profile for SSPC-SP15 power tool cleaned surfaces shall be within the range specified by the coating manufacturer, but not less than 2.0 mils (50 microns).

The surface profile produced by abrasive blast cleaning shall be determined by replica tape or digital profile depth micrometer according to SSPC-PA 17 at the beginning of the work, and each day that surface preparation is performed. Areas having unacceptable profile measurements shall be further tested to determine the limits of the deficient area. When replica tape is used, it shall be attached to the daily report. In the event of a conflict between measurements taken with the replica tape and digital profile depth micrometer, the measurements with the replica tape shall prevail.

The surface profile produced by power tools to SSPC-SP15, shall be measured using the digital profile depth micrometer only. Replica tape shall not be used.

When unacceptable profiles are produced, work shall be suspended. The Contractor shall submit a plan for the necessary adjustments to ensure that the correct surface profile is achieved on all surfaces. The Contractor shall not resume work until the new profile is verified by the QA observations, and the Engineer confirms, in writing, that the profile is acceptable.

Soluble Salt Remediation (HOLD POINT). The Contractor shall implement surface preparation procedures and processes that will remove chloride from the surfaces to levels below 7 micrograms per square centimeter. Surfaces that may be contaminated with chloride include, but are not limited to, expansion joints and all areas that are subject to roadway splash or run off such as fascia beams and stringers. Surfaces shall be tested for chlorides at a frequency of five tests per bearing line or fascia beam, with tests performed on both the beams and diaphragms/cross-frames at expansion joints.

Methods of chloride removal may include, but are not limited to, hand washing, steam cleaning, or pressure washing with or without the addition of a chemical soluble salt remover as approved by the coating manufacturer, and scrubbing before or after initial paint removal. The Contractor may also elect to clean the steel and allow it to rust overnight followed by recleaning, or by utilizing blends of fine and coarse abrasives during blast cleaning, wet abrasive/water jetting methods of preparation, or combinations of the above. If steam or water cleaning methods of chloride removal are utilized over surfaces where the coating has been completely removed, and the water does not contact any lead containing coatings, the water does not have to be collected. The Contractor shall provide the proposed procedures for chloride remediation in the Surface Preparation/Painting Plan.

Upon completion of the chloride remediation steps, the Contractor shall use cell methods of field chloride extraction and test procedures (e.g., silver dichromate) accepted by the Engineer, to test representative surfaces that were previously rusted (e.g., pitted steel) for the presence of remaining chlorides. Remaining chloride levels shall be no greater than $7\mu\text{g}/\text{sq cm}$ as read directly from the surface without any multiplier applied to the results. The testing must be performed, and the results must be acceptable, prior to painting each day.

A minimum of 5 tests per 1000 sq. ft. (93 sq m) or fraction thereof completed in a given day, shall be conducted at project start up. If results greater than $7\mu\text{g}/\text{sq cm}$ are detected, the surfaces shall be recleaned and retested at the same frequency. If acceptable results are achieved on three consecutive days in which testing is conducted, the test frequency may be reduced to 1 test per 1000 sq. ft. (93 sq. m) prepared each day provided the chloride remediation process remains unchanged. If unacceptable results are encountered, or the methods of chloride remediation are changed, the Contractor shall resume testing at a frequency of 5 tests per 1000 sq. ft. (93 sq. m).

Following successful chloride testing the chloride test areas shall be cleaned. SSPC-SP15, Commercial Grade Power Tool Cleaning can be used to clean the test locations when the specified degree of cleaning is SSPC-SP10.

Surface Condition Prior to Painting (HOLD POINT). Prepared surfaces shall meet the requirements of the respective degrees of cleaning immediately prior to painting, and shall be painted before rusting appears on the surface. If rust appears or bare steel remains unpainted for more than 12 hours, the affected area shall be prepared again at the expense of the Contractor.

All loose paint and surface preparation cleaning residue on bridge steel surfaces, scaffolding and platforms, containment materials, and tops of abutments and pier caps shall be removed prior to painting. When lead paint is being disturbed, cleaning shall be accomplished by HEPA vacuuming unless it is conducted within a containment that is designed with a ventilation system capable of collecting the airborne dust and debris created by sweeping and blowing with compressed air.

The quality of surface preparation and cleaning of surface dust and debris must be accepted by the Engineer prior to painting. The Engineer has the right to reject any work that was performed without adequate provision for QA observations to accept the degree of cleaning. Rejected coating work shall be removed and replaced at the Contractor's expense.

General Paint Requirements. Paint storage, mixing, and application shall be accomplished according to these specifications and as specified in the paint manufacturer's written instructions and product data sheets for the paint system used. In the event of a conflict between these specifications and the coating manufacturers' instructions and data sheets, the Contractor shall advise the Engineer and comply with the Engineer's written resolution. Until a resolution is provided, the most restrictive conditions shall apply.

Unless noted otherwise, if a new concrete deck or repair to an existing deck is required, painting shall be done after the deck is placed and the forms have been removed.

- a) Paint Storage and Mixing. All Paint shall be stored according to the manufacturer's published instructions, including handling, temperatures, and warming as required prior to mixing. All coatings shall be supplied in sealed containers bearing the manufacturers name, product designation, batch number and mixing/thinning instructions. Leaking containers shall not be used.

The Contractor shall only use batches of material that have an IDOT MISTIC approval number. For multi-component materials, the batch number from one component is tested with specific batch numbers from the other component(s). Only the same batch number combinations that were tested and approved shall be mixed together for use.

Mixing shall be according to the manufacturer's instructions. Thinning shall be performed using thinner provided by the manufacturer, and only to the extent allowed by the manufacturer's written instructions. In no case shall thinning be permitted that would cause the coating to exceed the local Volatile Organic Compound (VOC) emission restrictions. For multiple component paints, only complete kits shall be mixed and used. Partial mixing is not allowed.

The ingredients in the containers of paint shall be thoroughly mixed by mechanical power mixers according to the manufacturer's instructions, in the original containers before use or mixing with other containers of paint. The paint shall be mixed in a manner that will break up all lumps, completely disperse pigment and result in a uniform composition. Paint shall be carefully examined after mixing for uniformity and to verify that no unmixed pigment remains on the bottom of the container. Excessive skinning or partial hardening due to improper or prolonged storage will be cause for rejection of the paint, even though it may have been previously inspected and accepted and the container may have been unopened.

Multiple component coatings shall be discarded after the expiration of the pot life. Single component paint shall not remain in spray pots, paint buckets, etc. overnight. It shall be stored in a covered container and remixed before use.

The Engineer reserves the right to sample field paint (individual components and/or the mixed material) and have it analyzed. If the paint does not meet the product requirements due to excessive thinning or because of other field problems, the coating shall be removed from that section of the structure and replaced as directed by the Engineer.

- b) Application Methods. Unless prohibited by the coating manufacturer's written instructions, paint may be applied by spray methods, rollers, or brushes. If applied with conventional or airless spray methods, paint shall be applied in a uniform layer with overlapping at the edges of the spray pattern.

The painters shall monitor the wet film thickness of each coat during application. The wet film thickness shall be calculated based on the solids by volume of the material and the amount of thinner added. When the new coating is applied over an existing system, routine QC inspections of the wet film thickness shall be performed in addition to the painter's checks in order to establish that a proper film build is being applied.

When brushes or rollers are used to apply the coating, additional applications may be required to achieve the specified thickness per layer.

- c) Field Touch Up of Shop-Coated Steel. After cleaning, rusted and damaged areas of shop-primed inorganic zinc shall be touched up using epoxy mastic. Damaged areas of shop-applied intermediate shall be touched-up using the same intermediate specified for painting the existing structure. Following touch up, the remaining coats (intermediate and finish, or finish only, depending on the number of coats applied in the shop) shall be the same materials specified for painting the existing structure. When inorganic zinc has been used as the shop primer, a mist coat of the intermediate coat shall be applied before the application of the full intermediate coat in order to prevent pinholing and bubbling.
- d) Recoating and Film Continuity (HOLD POINT for each coat). Paint shall be considered dry for recoating according to the time/temperature/humidity criteria provided in the manufacturer's instructions and when an additional coat can be applied without the development of film irregularities; such as lifting, wrinkling, or loss of adhesion of the under coat. The coating shall be considered to be too cured for recoating based on the maximum recoat times stipulated by the coating manufacturer. If the maximum recoat times are exceeded, written instructions from the manufacturer for preparing the surface to receive the next coat shall be provided to the Engineer. Surface preparation and application shall not proceed until the recommendations are accepted by the Engineer in writing. If surfaces are contaminated, washing shall be accomplished prior to intermediate and final coats. Wash water does not have to be collected unless the water contacts existing lead containing coatings.

Painting shall be done in a neat and workmanlike manner. Each coat of paint shall be applied as a continuous film of uniform thickness free of defects including, but not limited

to, runs, sags, overspray, dryspray, pinholes, voids, skips, misses, and shadow-through. Defects such as runs and sags shall be brushed out immediately during application. Dry spray on the surface of previous coats shall be removed prior to the application of the next coat.

Paint Systems. The paint system(s) from the list below shall be applied as specified.

The paint manufacturer's relative humidity, dew point, and material, surface, and ambient temperature restrictions shall be provided with the submittals and shall be strictly followed. Written recommendations from the paint manufacturer for the length of time each coat must be protected from cold or inclement weather (e.g., exposure to rain), during the drying period shall be included in the submittals. Upon acceptance by the Engineer, these times shall be used to govern the duration that protection must be maintained during drying.

Where stripe coats are indicated, the Contractor shall apply an additional coat to edges, rivets, bolts, crevices, welds, and similar surface irregularities. The stripe coat shall be applied by brush or spray, but if applied by spray, it shall be followed immediately by brushing to thoroughly work the coating into or on the irregular surfaces, and shall extend onto the surrounding steel a minimum of 1 in. (25 mm) in all directions. The purpose of the stripe coat is to assure complete coverage of crevices and to build additional thickness on edges and surface irregularities. If the use of the brush on edges pulls the coating away, brushing of edges can be eliminated, provided the additional coverage is achieved by spray. Measurement of stripe coat thickness is not required, but the Contractor shall visually confirm that the stripe coats are providing the required coverage.

The stripe coat may be applied as part of the application of the full coat unless prohibited by the coating manufacturer. If applied as part of the application process of the full coat, the stripe coat shall be allowed to dry for a minimum of 10 minutes in order to allow Contractor QC personnel to verify that the coat was applied. If a wet-on-wet stripe coat is prohibited by the coating manufacturer or brush or roller application of the full coat pulls the underlying stripe coat, the stripe coat shall dry according to the manufacturers' recommended drying times prior to the application of the full coat. In the case of the prime coat, the full coat can also be applied first to protect the steel, followed by the stripe coat after the full coat has dried.

The thicknesses of each coat as specified below shall be measured according to SSPC-PA2, using Coating Thickness Restriction Level 3 (spot measurements 80% of the minimum and 120% of the maximum, provided the entire area complies with the specified ranges).

- a) System 1 – OZ/E/U – for Bare Steel: System 1 shall consist of the application of a full coat of organic (epoxy) zinc-rich primer, a full intermediate coat of epoxy, and a full finish coat of aliphatic urethane. Stripe coats of the prime and finish coats shall be applied. The film thicknesses of the full coats shall be as follows:
 - One full coat of organic zinc-rich primer between 3.5 and 5.0 mils (90 and 125 microns) dry film thickness. The prime coat shall be tinted to a color that contrasts with the steel surface.

- One full intermediate coat of epoxy between 3.0 and 6.0 mils (75 and 150 microns) dry film thickness. The intermediate coat shall be a contrasting color to both the first coat and finish coat.
- One full finish coat of aliphatic urethane between 2.5 and 4.0 mils (65 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 9.0 and 15.0 mils (225 and 375 microns).

- b) System 2 – PS/EM/U – for Overcoating an Existing System: System 2 shall consist of the application of a full coat of epoxy penetrating sealer, a spot intermediate coat of aluminum epoxy mastic and a stripe and full finish coat of aliphatic urethane.

A full coat of epoxy penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of the aluminum epoxy mastic on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full finish coat of aliphatic urethane shall be applied. The film thicknesses shall be as follows:

- One full coat of epoxy penetrating sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One spot coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The color shall contrast with the finish coat.
- One full finish coat of aliphatic urethane between 2.5 and 4.0 mils (65 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of the stripe coat, shall be between 8.5 and 13.0 mils (215 and 325 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

- c) System 3 – EM/EM/AC – for Bare Steel: System 3 shall consist of the application of two full coats of aluminum epoxy mastic and a full finish coat of waterborne acrylic. Stripe coats for first coat of epoxy mastic and the finish coat shall be applied. The film thicknesses of the full coats shall be as follows:

- One full coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The first coat of aluminum epoxy mastic shall be tinted a contrasting color with the blast cleaned surface and the second coat.

- One full intermediate coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The intermediate coat shall be a contrasting color to the first coat and the finish coat.
- A full finish coat of waterborne acrylic between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 12.0 and 18.0 mils (360 and 450 microns).

- d) System 4 – PS/EM/AC – for Overcoating an Existing System: System 4 shall consist of the application of a full coat of epoxy penetrating sealer, a spot intermediate coat of aluminum epoxy mastic and a stripe and full finish coat of waterborne acrylic.

A full coat of epoxy penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of the aluminum epoxy mastic on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full finish coat of waterborne acrylic shall be applied. The film thicknesses shall be as follows:

- One full coat of epoxy penetrating sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One spot coat of aluminum epoxy mastic between 5.0 and 7.0 mils (125 and 175 microns) dry film thickness. The color shall contrast with the finish coat.
- One full finish coat of waterborne acrylic between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of the stripe coat, shall be between 8.0 and 13.0 mils (200 and 325 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

- e) System 5 – MCU – for Bare Steel: System 5 shall consist of the application of a full coat of moisture cure urethane (MCU) zinc primer, a full coat of MCU intermediate, and a full coat of MCU finish. Stripe coats of the prime and finish coats shall be applied. The Contractor shall comply with the manufacturer's requirements for drying times between the application of the stripe coats and the full coats. The film thicknesses of the full coats shall be as follows:

- One full coat of MCU zinc primer between 3.0 and 5.0 mils (75 and 125 microns) dry film thickness. The prime coat shall be tinted to a color that contrasts with the steel surface.

- One full MCU intermediate coat between 3.0 and 4.0 mils (75 and 100 microns) dry film thickness. The intermediate coat shall be a contrasting color to both the first coat and finish coat.
- One full MCU finish coat between 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 8.0 and 13.0 mils (200 and 325 microns).

- f) System 6 – MCU – for Overcoating an Existing System: System 6 shall consist of the application of a full coat of moisture cure urethane (MCU) penetrating sealer, a spot coat of MCU intermediate, and a stripe and full coat of MCU finish.

A full coat of MCU penetrating sealer shall be applied to all surfaces following surface preparation. A spot intermediate coat shall consist of the application of one coat of MCU intermediate on all areas where rust is evident and areas where the old paint has been removed, feathered and/or damaged prior to, during or after the cleaning and surface preparation operations. After the spot intermediate, a stripe coat and full coat of MCU finish shall be applied. The Contractor shall comply with the manufacturer's requirements for drying time between the application of the stripe coat and the full finish coat. The film thicknesses shall be as follows:

- One full coat of MCU sealer between 1.0 and 2.0 mils (25 and 50 microns) dry film thickness.
- One full MCU intermediate coat between 3.0 and 4.0 mils (75 and 100 microns) dry film thickness. The color shall contrast with the finish coat.
- One full MCU finish coat 2.0 and 4.0 mils (50 and 100 microns) dry film thickness. Finish coat color shall be according to contract plans.

The total dry film thickness for this system, exclusive of areas receiving the stripe coats, shall be between 6.0 and 10.0 mils (150 and 250 microns). The existing coating thickness to remain under the overcoat must be verified in order to obtain accurate total dry film thickness measurements.

Application of Paint System over Galvanizing: If galvanized surfaces are present and specified to be painted, the Contractor shall apply one of the following as designated on the plans:

- A 2-coat system consisting of a full aluminum epoxy mastic coat and a full waterborne acrylic finish coat from System 3. If red rust is visible, rusted areas shall be spot primed with aluminum epoxy mastic prior to the application of the full coat of aluminum epoxy mastic.

- A 2-coat system consisting of a full epoxy coat and a full urethane coat from System 1. If red rust is visible, rusted areas shall be spot primed with organic zinc prior to the application of the full coat of epoxy.

Surface Preparation and Painting of Galvanized Fasteners: The Contractor shall prepare all fasteners (i.e., galvanized nuts, bolts, etc.) by power tool cleaning in accordance with SSPC-SP 2 or SSPC-SP3 to remove loose material. Following hand/power tool cleaning and prior to painting, the surfaces shall be solvent cleaned according to SSPC-SP 1. Slight stains of torqueing compound dye may remain after cleaning provided the dye is not transferred to a cloth after vigorous rubbing is acceptable. If any dye is transferred to a cloth after vigorous rubbing, additional cleaning is required.

The fasteners shall be coated with one coat of an aluminum epoxy mastic meeting the requirements of Article 1008.03 and the same acrylic or urethane topcoat specified above for use on galvanized members.

Repair of Damage to New Coating System and Areas Concealed by Containment. The Contractor shall repair all damage to the newly installed coating system and areas concealed by the containment/protective covering attachment points, at no cost to the Department. The process for completing the repairs shall be included in the submittals. If the damage extends to the substrate and the original preparation involved abrasive blast cleaning, the damaged areas shall be prepared to SSPC-SP15 Power Tool Cleaning - Commercial Grade. If the original preparation was other than blast cleaning or the damage does not extend to the substrate, the loose, fractured paint shall be cleaned to Power Tool Cleaning – Modified SP3.

The surrounding coating at each repair location shall be feathered for a minimum distance of 1 1/2 in. (40 mm) to achieve a smooth transition between the prepared areas and the existing coating.

If the bare steel is exposed, all coats shall be applied to the prepared area. For damaged galvanizing, the first coat shall be aluminum epoxy mastic. If only the intermediate and finish coats are damaged, the intermediate and finish shall be applied. If only the finish coat is damaged, the finish shall be applied.

Special Instructions.

- a) At the completion of the work, the Contractor shall stencil the painting date and the paint code on the bridge. The letters shall be capitals, not less than 2 in. (50 mm) and not more than 3 in. (75 mm) in height.

The stencil shall contain the following wording "PAINTED BY (insert the name of the Contractor)" and shall show the month and year in which the painting was completed, followed by the appropriate code for the coating material applied, all stenciled on successive lines:

CODE U (for field applied System 3 or System 4).

CODE Z (for field applied System 1 or System 2).

CODE AA (for field applied System 5 or System 6).

This information shall be stenciled on the cover plate of a truss end post near the top of the railing, or on the outside face of an outside stringer near one end of the bridge, or at some equally visible surface near the end of the bridge, as designated by the Engineer.

- b) All surfaces painted inadvertently shall be cleaned immediately.
- c) Caulking complex structures. Pack rust shall be removed prior to the application of the approved sealant as per the Laminar and Stratified Rust article of this special provision. Chloride shall be remediated as specified elsewhere in this provision. The caulk shall be compatible with the approved paint system, and applied in accordance with the paint manufacturers recommendations as described in the Contractors submittal

The following coatings shall be applied prior to the application of the caulk. Stripe coat of organic zinc primer, full coat of organic zinc primer, intermediate epoxy stripe coat, full coat of epoxy intermediate, full coat of urethane finish. Apply caulk after the urethane has dried for top coating. After the caulk has been applied it shall be allowed to dry to coat according the manufacturer's written recommendations and a stripe coat of urethane applied to all areas of caulking.

Alternatively, as directed by the Engineer, apply the caulking after the intermediate coat has dried for overcoating. After the caulking has dried according to the manufacturer's written recommendations, apply the urethane finish over the caulking and intermediate coat.

1. All vertical, diagonal and horizontal lapping members shall be caulked along the top and sides. The bottom shall remain open for drainage.
2. Locations where pack rust was removed leaving a gap between two steel surfaces shall also be caulked. Locations greater than $\frac{1}{4}$ inch in depth shall be filled with a closed cell backer rod in accordance with the caulking manufacturer's instructions prior to the application of the caulk.

It is understood and agreed that the cost of all work outlined above, unless otherwise specified, has been included in the bid, and no extra compensation will be allowed.

Basis of Payment. This work shall be paid for at the contract Lump Sum price for CLEANING AND PAINTING STEEL BRIDGE, at the designated location, or for CLEANING AND PAINTING the structure or portions thereof described. Payment will not be authorized until all requirements for surface preparation and painting have been fulfilled as described in this specification, including the preparation and submittal of all QC documentation. Payment will also not be authorized for non-conforming work until the discrepancy is resolved in writing.

Appendix 1 – Reference List

The Contractor shall maintain the following regulations and references on site for the duration of the project:

- Illinois Environmental Protection Act
- ASTM D 4214, Standard Test Method for Evaluating Degree of Chalking of Exterior Paint Films
- ASTM D 4285, Standard Test Method for Indicating Oil or Water in Compressed Air
- ASTM D4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
- SSPC-AB 1, Mineral and Slag Abrasives
- SSPC-AB 2, Cleanliness of Recycled Ferrous Metallic Abrasives
- SSPC-AB 3, Ferrous Metallic Abrasive
- SSPC-PA 2, Procedure for Determining Conformance to Dry Coating Thickness Requirements
- SSPC-PA 17, Procedure for Determining Conformance to Steel Profile/Surface Roughness/Peak Count Requirements
- SSPC-QP 1, Standard Procedure for Evaluating Painting Contractors (Field Application to Complex Structures)
- SSPC-QP 2, Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint
- SSPC-SP 1, Solvent Cleaning
- SSPC-SP 2, Hand Tool Cleaning
- SSPC-SP 3, Power Tool Cleaning
- SSPC-SP 10/NACE No. 2, Near White Metal Blast Cleaning
- SSPC-SP WJ-4, Waterjet Cleaning of Metals – Light Cleaning
- SSPC-SP 15, Commercial Grade Power Tool Cleaning
- SSPC-SP 16, Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals
- SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
- SSPC-VIS 3, Visual Standard for Power- and Hand-Tool Cleaned Steel
- SSPC-VIS 4, Guide and Reference Photographs for Steel Cleaned by Water Jetting
- SSPC-VIS 5, Guide and Reference Photographs for Steel Prepared by Wet Abrasive Blast Cleaning
- The paint manufacturer's application instructions, MSDS and product data sheets

PIPE UNDERDRAINS FOR STRUCTURES

Effective: May 17, 2000

Revised: October 23, 2020

Add the following to the table following the second paragraph of Article 601.01:

Type	Description
Pipe Underdrains for Structures	A perforated pipe, encased in fabric, installed in a trench backfilled with coarse and fine aggregate
Pipe Underdrains for Structures (Special)	A non-perforated pipe installed in a trench to outlet Pipe Underdrains for Structures

Revise the first sentence of Article 601.02(e) as follows:

(e) Pipe Underdrains (Special) and Pipe Underdrains for Structures (Special). Materials for pipe underdrains (special) and pipe underdrains for structures (special) shall be according to the following.

Add the following to Article 601.02:

(g) Pipe Underdrains for Structures

Item	Article/Section
(1) Perforated Corrugated Steel Pipe (Note 1) (Note 3)	1006.01
(2) Perforated Polyvinyl Chloride (PVC) Pipe (Note 3)	1040.03
(3) Perforated Corrugated Polyvinyl Chloride (PVC) Pipe with a Smooth Interior (Note 3)	1040.03
(4) Perforated Corrugated Polyethylene (PE) Pipe (Note 2) (Note 3)	1040.04
(5) Perforated Corrugated Polyethylene (PE) Pipe with a Smooth Interior (Note 3)	1040.04
(6) Fine Aggregate for Bedding and Backfill (Note 5).....	1003.04
(7) Coarse Aggregate for Bedding and Backfill (Note 5).....	1004.05
(8) Geotechnical Fabric.....	1080.05

Note 5. Fine and Coarse Aggregate shall meet the requirements of Section 586.

Revise the first sentence of Article 601.04(d) as follows:

(e) Pipe Underdrains (Special) and Pipe Underdrains for Structures (Special). Pipe underdrains (special) and pipe underdrains for structures (special) used for outletting pipe underdrains shall be according to the trench requirements for pipe underdrains.

Revise the first sentence of Article 601.05 as follows:

Concrete headwalls for pipe drains, pipe underdrains (special), pipe underdrains for structures (special), and backslope drains shall be constructed at the locations and according to the details shown on the plans.

Revise Article 601.07 as follows:

601.07 Method of Measurement. Pipe drains, pipe underdrains, pipe underdrains for structures, pipe underdrains (special), and pipe underdrains for structures (special) will be measured for payment in feet (meters) in place.

Measurement for pipe underdrain (special) and pipe underdrains for structures (special) will be made from the back of the headwall to the centerline of the pipe underdrain or pipe underdrain for structures.

Add the following sentence to Article 601.08:

Pipe underdrains for structures will be paid for at the contract unit price per foot (meter) for PIPE UNDERDRAINS FOR STRUCTURES, of the diameter specified. Pipe underdrains for structures (special) will be paid for at the contract unit price per foot (meter) for PIPE UNDERDRAINS FOR STRUCTURES (SPECIAL), of the diameter specified.

CONTAINMENT AND DISPOSAL OF NON-LEAD PAINT CLEANING RESIDUES

Effective: November 25, 2004

Revised: April 22, 2016

Description. This work shall consist of the containment, collection, temporary storage, transportation and disposal of waste from non-lead paint removal projects. Waste requiring containment and control includes, but is not limited to, old paint, spent abrasives, corrosion products, mill scale, dirt, dust, grease, oil, and salts.

General. This specification provides the requirements for the control of paint removal waste when the existing coatings do not contain lead. If the coatings contain lead, use specification "Containment and Disposal of Lead Paint Cleaning Residues." The Contractor shall take reasonable and appropriate precautions to protect the public from the inhalation or ingestion of dust and debris from their paint removal and clean up operations and is responsible for the clean-up of all spills of waste at no additional cost to the Department.

The Contractor shall comply with the requirements of this Specification and all applicable Federal, State, and Local laws, codes, and regulations, including, but not limited to the regulations of the United States Environmental Protection Agency (USEPA), Occupational Safety and Health Administration (OSHA), and Illinois Environmental Protection Agency (IEPA). The Contractor shall comply with all applicable regulations even if the regulation is not specifically referenced herein. If a Federal, State, or Local regulation is more restrictive than the requirements of this Specification, the more restrictive requirements shall prevail.

Submittals. The Contractor shall submit for Engineer review and acceptance, the following drawings and plans for accomplishing the work. The submittals shall be provided within 30 days of execution of the contract unless given written permission by the Engineer to submit them at a later date. Work cannot proceed until the submittals are accepted by the Engineer. Details for each of the plans are presented within the body of this specification.

- a) Containment Plans. The containment plans shall include drawings, equipment specifications, and calculations (e.g., wind load). The plans shall include copies of the manufacturer's specifications for the containment materials and equipment that will be used to accomplish containment and ventilation.

When required by the contract plans, the containment submittal shall provide calculations that assure the structural integrity of the bridge when it supports the containment and the calculations and drawings shall be signed and sealed by a Structural Engineer licensed in the state of Illinois.

When working over the railroad or navigable waterways, the Department will notify the respective agencies that work is being planned. Unless otherwise noted in the plans, the Contractor is responsible for follow up contact with the agencies, and shall provide evidence that the railroad, Coast Guard, Corps of Engineers, and other applicable agencies are satisfied with the clearance provided and other safety measures that are proposed.

- b) Waste Management Plan. The Waste Management Plan shall address all aspects of handling, storage, testing, hauling and disposal of all project waste, including waste water. Include the names, addresses, and a contact person for the proposed licensed waste haulers and disposal facilities. Submit the name and qualifications of the laboratory proposed for Toxicity Characteristic Leaching Procedure (TCLP) analysis.
- c) Contingency Plan. The Contractor shall prepare a contingency plan for emergencies including fire, accident, failure of power, failure of supplied air system or any other event that may require modification of standard operating procedures. The plan shall include specific procedures to ensure safe egress and proper medical attention in the event of an emergency.

When the Engineer accepts the submittals, the Contractor will receive written notification. The Contractor shall not begin any work until the Engineer has accepted the submittals. The Contractor shall not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the work, or for addressing health and safety concerns. Acceptance of the plans does not relieve the Contractor from the responsibility to conduct the work according to the requirements of Federal, State, or Local regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Quality Control (QC) Inspections. The Contractor shall perform first line, in process QC inspections of all environmental control and waste handling aspects of the project to verify compliance with these specification requirements and the accepted drawings and plans. Contractor QC inspections shall include, but not be limited to the following:

- Proper installation and continued performance of the containment system(s) in accordance with the approved drawings.
- Visual inspections of emissions into the air and verification that the cause(s) for any unacceptable emissions is corrected.
- Visual inspections of spills or deposits of contaminated materials into the water or onto the ground, pavement, soil, or slope protection. Included is verification that proper cleanup is undertaken and that the cause(s) of unacceptable releases is corrected.
- Proper implementation of the waste management plan including laboratory analysis and providing the results to the Engineer within the time frames specified herein.
- Proper implementation of the contingency plans for emergencies.

Quality Assurance (QA) Observations. The Engineer will conduct QA observations of any or all of the QC monitoring inspections that are undertaken. The presence or activity of Engineer observations in no way relieves the Contractor of the responsibility to provide all necessary daily QC inspections of its own and to comply with all requirements of this Specification.

Containment Requirements. The Contractor shall install and maintain containment systems surrounding the work for the purpose of controlling emissions of dust and debris according to the requirements of this specification. Working platforms and containment materials that are

used shall be firm and stable and platforms shall be designed to support the workers, inspectors, spent surface preparation media (e.g., abrasives), and equipment during all phases of surface preparation and painting. Platforms, cables, and other supporting structures shall be designed according to OSHA regulations. If the containment needs to be attached to the structure, the containment shall be attached by bolting, clamping, or similar means. Welding or drilling into the structure is prohibited unless approved by the Engineer in writing.

The containment shall be dropped in the event of sustained winds of 40 mph (64 kph) or greater and all materials and equipment secured.

The Contractor shall provide drawings showing the containment system and indicating the method(s) of supporting the working platforms and containment materials to each other and to the bridge.

When directed in the contract plans, the Contractor shall submit calculations and drawings, signed and sealed by a Structural Engineer licensed in the state of Illinois, that assure the structural integrity of the bridge under the live and dead loads imposed, including the design wind loading.

When working over railroads, the Contractor shall provide evidence that the proposed clearance and the safety provisions that will be in place (e.g., flagman) are acceptable to the railroad. In the case of work over navigable waters, the Contractor shall provide evidence that the proposed clearance and provisions for installing or moving the containment out of navigation lanes is acceptable to authorities such as the Coast Guard and Army Corps of Engineers. The Contractor shall include plans for assuring that navigation lighting is not obscured, or if it is obscured, that temporary lighting is acceptable to the appropriate authorities (e.g., Coast Guard) and will be utilized.

Engineer review and acceptance of the drawings and calculations shall not relieve the Contractor from the responsibility for the safety of the working platforms and containment. After the work platforms and containment materials are erected additional measures may be needed to ensure worker safety according to OSHA regulations. The Contractor shall institute such measures at no additional cost to the Department.

Containment for the cleaning operation of this contract is defined as follows:

- The containment system shall confine emissions of dust and debris to the property line.
- The containment systems shall comply with the specified SSPC Guide 6 classifications, as applicable, as presented in Table 1 for the method of paint removal utilized.

The Contractor shall take appropriate action to avoid personnel injury or damage to the structure from the installation and use of the containment system. If the Engineer determines that there is the potential for structural damage caused by the installed containment system, the Contractor shall take appropriate action to correct the situation.

The containment systems shall also meet the following requirements:

a) Dry Abrasive Blast Cleaning - (SSPC Class 2A)

The enclosure shall be designed, installed, and maintained to sustain maximum anticipated wind forces. Flapping edges of containment materials are prohibited and the integrity of all containment materials shall be maintained for the duration of the project. When the location of the work on the bridge, or over lane closures permit, the blast enclosure shall extend a minimum of 3 ft (1 m) beyond the limits of surface preparation to allow the workers to blast away from, rather than into the seam between the containment and the structure.

b) Vacuum Blast Cleaning

Vacuum blasting equipment shall be fully automatic and capable of cleaning and recycling the abrasive. The system shall be designed to deliver cleaned, recycled blasting abrasives and provide a closed system containment during blasting. The removed coating, mill scale, and corrosion shall be separated from the abrasive, and stored for disposal. No additional containment is required but escaping abrasive, paint chips, and debris shall be cleaned from the work area at the end of each day.

c) Power Tool Cleaning (SSPC-Class 3P)

The Contractor shall use containment materials (e.g., tarpaulins) to capture removed paint chips, rust, mill scale and other debris.

d) Vacuum-Shrouded Power Tool Cleaning/Hand Tool Cleaning

The Contractor shall utilize hand tools or power tools equipped with vacuums and High Efficiency Particulate Air (HEPA) filters. No additional containment is required but escaping and paint chips and debris shall be cleaned from the work area at the end of each day.

e) Water Jetting or Wet Abrasive Blast Cleaning for the Removal of Paint (SSPC Class 4W)

Water jetting or wet abrasive blast cleaning for the purpose of removing paint and surface debris shall be conducted within a containment designed, installed, and maintained in order to capture paint chips and debris. Collection of the water is not required. Mesh containment materials that capture paint chips and debris while allowing the water to pass through shall have openings a maximum of 25 mils (625 microns) in greatest dimension.

f) Water Washing

Water washing of the bridge for the purpose of removing chalk, dirt, grease, oil, bird nests, and other surface debris can be performed without additional containment provided paint chips and removed debris are removed and collected prior to washing or are cleaned from

the site after cleaning is completed each day. At the Contractor's option, SSPC Class 4W permeable containment materials described above under "Water Jetting or Wet Abrasive Blast Cleaning for the Removal of Paint" can be used to collect the debris while the washing is underway.

Environmental Controls

- a) Cleanliness of ground and water. At the end of each workday at a minimum, the work area outside of containment, including any ground tarpaulins that are used, shall be inspected to verify that paint removal debris (e.g., paint chips, abrasives, rust, etc.) is not present. If debris is observed, it shall be removed by hand, shoveling, sweeping, or vacuuming.

Upon project completion, the ground and water in and around the project site are considered to have been properly cleaned if paint chips, paint removal media (e.g., spent abrasives), fuel, materials of construction, litter, or other project debris have been removed, even if the material being cleaned was a pre-existing condition.

- b) Visible Emissions. Emissions of dust and debris from the project shall not extend beyond the property line. If unacceptable visible emissions or releases beyond the property line are observed, the Contractor shall immediately shut down the emission-producing operations, clean up the debris, and change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future.

Hygiene Facilities/Protective Clothing. The Contractor shall provide clean lavatory and hand washing facilities according to OSHA regulations and make them available to IDOT project personnel.

The Contractor shall provide IDOT project personnel with all required protective clothing and equipment, including disposal or cleaning. Clothing and equipment includes but is not limited to disposable coveralls with hood, booties, disposable surgical gloves, hearing protection, and safety glasses. The protective clothing and equipment shall be provided and maintained on the job site for the exclusive, continuous and simultaneous use by the IDOT personnel. This equipment shall be suitable to allow inspection access to any area in which work is being performed.

Site Emergencies.

- a) Stop Work. The Contractor shall stop work at any time the conditions are not within specifications and take the appropriate corrective action. The stoppage will continue until conditions have been corrected. Standby time and cost required for corrective action is at the Contractor's expense. The occurrence of the following events shall be reported in writing to IDOT and shall require the Contractor to automatically stop paint removal and initiate clean up activities.

- Break in containment barriers.
- Visible emissions in excess of the specification tolerances.

- Serious injury within the containment area.
- Fire or safety emergency
- Respiratory system failure
- Power failure

b) Contingency Plans and Arrangements. The Engineer will refer to the contingency plan for site specific instructions in the case of emergencies.

The Contractor shall prepare a contingency plan for emergencies including fire, accident, failure of power, failure of supplied air system or any other event that may require modification of standard operating procedures during paint removal and painting processes. The plan shall include specific procedures to ensure safe egress and proper medical attention in the event of an emergency. The Contractor shall post the telephone numbers and locations of emergency services including fire, ambulance, doctor, hospital, police, power company and telephone company.

A two-way radio, or equal, as approved by the Engineer, capable of summoning emergency assistance shall be available at each bridge during the time the Contractor's personnel are at the bridge site under this contract. The following emergency response equipment described in the contingency plan (generic form attached) shall be available during this time as well: an appropriate portable fire extinguisher, a 55 gal (208 L) drum, a 5 gal (19 L) pail, a long handled shovel, absorbent material (one bag).

A copy of the contingency plan shall be maintained at each bridge during cleaning operations and during the time the Contractor's personnel are at the bridge site under this contract. The Contractor shall designate the emergency coordinator(s) required who shall be responsible for the activities described.

An example of a contingency plan is included at the end of this Special Provision.

Collection, Temporary Storage, Transportation and Disposal of Waste.

All surface preparation/paint residues shall be collected daily and deposited in all-weather containers supplied by the Contractor as temporary storage. The storage area shall be secure to prevent unauthorized entry or tampering with the containers. Acceptable measures include storage within a fully enclosed (e.g., fenced in) and locked area, within a temporary building, or implementing other reasonable means to reduce the possibility of vandalism or exposure of the waste to the public or the environment (e.g., chains and locks to secure the covers of roll-off boxes). Waste shall not be stored outside of the containers.

No residues shall remain on uncontained surfaces overnight. Waste materials shall not be removed through floor drains or by throwing them over the side of the bridge. Flammable materials shall not be stored around or under any bridge structures.

The Contractor shall have each waste stream sampled for each project and tested by TCLP and according to EPA and disposal company requirements. The Engineer shall be notified in advance when the samples will be collected. The samples shall be collected and shipped for

testing within the first week of the project, with the results due back to the Engineer within 10 days. Testing shall be considered included in the pay item for "Containment and Disposal of Non-Lead Paint Cleaning Residues." Copies of the test results shall be provided to the Engineer prior to shipping the waste. If the waste tests hazardous, the Contractor shall comply with all provision of "Collection, Temporary Storage, Transportation and Disposal of Waste" found in specification "Containment and Disposal of Lead Paint Cleaning Residues," except additional costs will be paid for according to Article 109.04.

If the waste is found to be non-hazardous as determined by TCLP testing, the waste shall be classified as a non-hazardous special waste, transported by a licensed waste transporter, and disposed of at an IEPA permitted disposal facility in Illinois.

The waste shall be shipped to the disposal facility within 90 days of the first accumulation of the waste in the containers. When permitted by the Engineer, waste from multiple bridges in the same contract may be transported by the Contractor to a central waste storage location(s) approved by the Engineer in order to consolidate the material for pick up, and to minimize the storage of waste containers at multiple remote sites after demobilization. Arrangements for the final waste pickup shall be made with the waste hauler by the time blast cleaning operations are completed or as required to meet the 90-day limit stated above.

All other project waste shall be removed from the site according to Federal, State and Local regulations, with all waste removed from the site prior to final Contractor demobilization.

The Contractor shall make arrangements to have other hazardous waste, which he/she generates, such as used paint solvent, transported to the Contractor's facility at the end of each day that this waste is generated. These hazardous wastes shall be manifested using the Contractor's own generator number to a treatment or disposal facility from the Contractor's facility. The Contractor shall not combine solvents or other wastes with cleaning residue wastes. All waste streams shall be stored in separate containers.

The Contractor is responsible for the payment of any fines and undertaking any clean up activities mandated by State or federal environmental agencies for improper waste handling, storage, transportation, or disposal.

Basis of Payment. The containment, collection, temporary storage, transportation, testing and disposal of all project waste, and all other work described herein will be paid for at the contract lump sum price for CONTAINMENT AND DISPOSAL OF NON-LEAD PAINT CLEANING RESIDUES at the designated location. Payment will not be authorized until all requirements have been fulfilled as described in this specification, including the submittal of waste test results, and disposal of all waste.

Table 1 Containment Criteria for Removal of Paint and Other Debris¹					
Removal Method	SSPC Class²	Containment Material Flexibility	Containment Material Permeability³	Containment Support Structure	Containment Material Joints
Hand Tool Cleaning	None	See Note 4	See Note 4	See Note 4	See Note 4
Power Tool Cleaning w/ Vacuum	None	See Note 4	See Note 4	See Note 4	See Note 4
Power Tool Cleaning w/o Vacuum ⁵	3P	Rigid or Flexible	Permeable	Minimal	Partially Sealed
Water Jetting, Wet Abrasive Blast ⁶	4W	Flexible	Permeable	Flexible or Minimal	Partially Sealed
Water Cleaning ⁷	None	See Note 7	See Note 7	See Note 7	See Note 7
Open Abrasive Blast Cleaning ⁸	2A	Rigid or Flexible	Impermeable	Rigid or Flexible	Fully Sealed
Vacuum Blast Cleaning	None	See Note 4	See Note 4	See Note 4	See Note 4

Table 1 (Continued) Containment Criteria for Removal of Paint and Other Debris¹					
Removal Method	SSPC Class²	Containment Entryway	Ventilation System Required	Negative Pressure Required	Exhaust Filtration Required
Hand Tool Cleaning	None	See Note 4	See Note 4	See Note 4	See Note 4
Power Tool Cleaning w/ Vacuum	None	See Note 4	See Note 4	See Note 4	See Note 4
Power Tool Cleaning w/o Vacuum ⁵	3P	Open Seam	No	No	No
Water Jetting, Wet Abrasive Blast ⁶	4W	Open Seam	No	No	No
Water Cleaning ⁷	None	See Note 7	See Note 7	See Note 7	See Note 7
Open Abrasive Blast Cleaning ⁸	2A	Resealable or Overlap	Yes	Yes	Yes
Vacuum Blast Cleaning	None	See Note 4	See Note 4	See Note 4	See Note 4

Notes:

¹This table provides general design criteria only. It does not guarantee that specific controls over emissions will occur because unique site conditions must be considered in the design. Other combinations of materials may provide controls over emissions equivalent to or greater than those combinations shown above.

²The SSPC Classification is based on SSPC Guide 6.

³Permeability addresses both air and water as appropriate. In the case of water removal methods, the containment materials must be resistant to water. When ground covers are used they shall be of sufficient strength to withstand the impact and weight of the debris and the equipment used for collection and clean-up.

⁴Containment is not required provided paint chips and debris are removed from the ground and surfaces in and around the worksite at the end of each day. Ground tarpaulins can be used to simplify the cleanup. At the Contractor's option, permeable containment materials may be suspended under the work area to capture the debris at the time of removal. Permeable materials for the purpose of this specification are defined as materials with openings measuring 25 mils or less in greatest dimension.

⁵This method involves open power tool cleaning. The containment consists of permeable materials suspended beneath the work area to capture debris. As an option, if the work is close to the ground or bridge deck, ground covers can be used to capture the paint chips and debris for proper disposal.

⁶This method involves water jetting (with and without abrasive) and wet abrasive blast cleaning where the goal is to remove paint. Permeable containment materials are used to capture removed paint chips, debris, and abrasives (in the case of wet abrasive blast cleaning) while allowing the water to pass through. Permeable materials for the purpose of this specification are defined as materials with openings measuring 25 mils (625 microns) or less in greatest dimension.

⁷Chips and debris can be removed from the ground at the end of each shift, or the Contractor can install a Class 4W containment in the work area to collect the debris while allowing the water to pass through (see note 6)

⁸This method involves dry abrasive blast cleaning. Dust and debris shall not be permitted to escape from the containment.

Containment Components - The basic components that make up containment systems are defined below. The components are combined in Table 1 to establish the minimum containment system requirements for the method(s) of paint removal specified for the Contract.

1. Rigidity of Containment Materials - Rigid containment materials consist of solid panels of plywood, aluminum, rigid metal, plastic, fiberglass, composites, or similar materials. Flexible materials consist of screens, tarps, drapes, plastic sheeting, or similar materials. When directed by the Engineer, do not use flexible materials for horizontal surfaces directly over traffic lanes or vertical surfaces in close proximity to traffic lanes. If the Engineer allows the use of flexible materials, the Contractor shall take special precautions to completely secure the materials to prevent any interference with traffic.
2. Permeability of Containment Materials - The containment materials are identified as air impenetrable if they are impervious to dust or wind such as provided by rigid panels, coated solid tarps, or plastic sheeting. Air penetrable materials are those that are formed or woven to allow air flow. Water impermeable materials are those that are capable of containing and controlling water when wet methods of preparation are used. Water permeable materials allow the water to pass through. Chemical resistant materials are those resistant to chemical and solvent stripping solutions. Use fire retardant materials in all cases.
3. Support Structure - Rigid support structures consist of scaffolding and framing to which the containment materials are affixed to minimize movement of the containment cocoon. Flexible support structures are comprised of cables, chains, or similar systems to which the containment materials are affixed. Use fire retardant materials in all cases.
4. Containment Joints - Fully sealed joints require that mating surfaces between the containment materials and to the structure being prepared are completely sealed. Sealing measures include tape, caulk, Velcro, clamps, or other similar material capable of forming a continuous, impenetrable or impermeable seal. When materials are overlapped, a minimum overlap of 8 in. (200 mm) is required.
5. Entryway - An airlock entryway involves a minimum of one stage that is fully sealed to the containment and which is maintained under negative pressure using the ventilation system of the containment. Resealable door entryways involve the use of flexible or rigid doors capable of being repeatedly opened and resealed. Sealing methods include the use of zippers, Velcro, clamps, or similar fasteners. Overlapping door tarpaulin entryways consist of two or three overlapping door tarpaulins.

6. Mechanical Ventilation - The requirement for mechanical ventilation is to ensure that adequate air movement is achieved to reduce worker exposure to toxic metals to as low as feasible according to OSHA regulations (e.g., 29 CFR 1926.62), and to enhance visibility. Natural ventilation does not require the use of mechanical equipment for moving dust and debris through the work area.
7. Negative Pressure - When specified, achieve a minimum of 0.03 in.(7.5 mm) water column (W.C.) relative to ambient conditions, or confirm through visual assessments for the concave appearance of the containment enclosure.
8. Exhaust Ventilation - When mechanical ventilation systems are specified,, provide filtration of the exhaust air, to achieve a filtration efficiency of 99.9 percent at 0.5 microns.

CONTINGENCY PLAN
FOR
NON-LEAD BASED PAINT REMOVAL PROJECTS

Bridge No.: _____

Location: _____

Note:

1. A copy of this plan must be kept at the bridge while the Contractor's employees are at the site.
2. A copy of the plan must be mailed to the police and fire departments and hospital identified herein.

Primary Emergency Coordinator

Name: _____

Address: _____

City: _____

Phone: (Work) _____

(Home) _____

Alternate Emergency Coordinator

Name: _____

Address: _____

City: _____

Phone: (Work) _____

(Home) _____

Emergency Response Agencies

POLICE:

1. State Police (if bridge not in city) Phone: _____
District No. _____
Address: _____
2. County Sheriff _____ Phone: _____
County: _____
Address: _____
3. City Police _____ Phone: _____
District No. _____
Address: _____

Arrangements made with police: (Describe arrangements or refusal by police to make arrangements):

FIRE:

1. City _____ Phone: _____
Name: _____
Address: _____
2. Fire District _____ Phone: _____
Name: _____
Address: _____

3. Other _____ Phone: _____

Name: _____

Address: _____

Arrangements made with fire departments: (Describe arrangements or refusal by fire departments to make arrangements):

HOSPITAL:

Name: _____ Phone: _____

Address: _____

Arrangements made with hospital: (Describe arrangements or refusal by hospital to make arrangements):

Properties of waste and hazard to health:

Places where employees working:

Location of Bridge:

Types of injuries or illness which could result:

Appropriate response to release of waste to the soil:

Appropriate response to release of waste to surface water:

Emergency Equipment at Bridge

Emergency Equipment List	Location of Equipment	Description of Equipment	Capability of Equipment
1. Two-way radio	Truck		Communication
2. Portable Fire Extinguisher	Truck		Extinguishes Fire
3. Absorbent Material	Truck		Absorbs Paint or Solvent Spills
4. Hand Shovel	Truck		Scooping Material
5. 208 L (55 Gallon) Drum	Truck		Storing Spilled Material
6. 19 L (5 Gallon) Pail	Truck		Storing Spilled Material

Emergency Procedure

1. Notify personnel at the bridge of the emergency and implement emergency procedure.
2. Identify the character, source, amount and extent of released materials.
3. Assess possible hazards to health or environment.
4. Contain the released waste or extinguish fire. Contact the fire department if appropriate.
5. If human health or the environment is threatened, contact appropriate police and fire department. In addition, the Emergency Services and Disaster Agency needs to be called using their 24-hour toll free number (800-782-7860) and the National Response Center using their 24-hour toll free number (800-824-8802).
6. Notify the Engineer that an emergency has occurred.
7. Store spilled material and soil contaminated by spill, if any, in a drum or pail. Mark and label the drum or pail for disposal.
8. Write a full account of the spill or fire incident including date, time, volume, material, and response taken.
9. Replenish stock of absorbent material or other equipment used in response.

BRIDGE DECK CONSTRUCTION

Effective: October 22, 2013

Revised: December 21, 2016

When Diamond Grinding of Bridge Sections is specified, hand finishing of the deck surface shall be limited to areas not finished by the finishing machine and to address surface corrections according to Article 503.16(a)(2). Hand finishing shall be limited as previously stated solely for the purpose of facilitating a more timely application of the curing protection. In addition the requirements of 503.16(a)(3)a. and 503.16(a)(4) will be waived.

Revise the Second Paragraph of Article 503.06(b) to read as follows.

“When the Contractor uses cantilever forming brackets on exterior beams or girders, additional requirements shall be as follows.”

Revise Article 503.06(b)(1) to read as follows.

- “(1) Bracket Placement. The spacing of brackets shall be per the manufacturer’s published design specifications for the size of the overhang and the construction loads anticipated. The resulting force of the leg brace of the cantilever bracket shall bear on the web within 6 inches (150 mm) of the bottom flange of the beam or girder.”

Revise Article 503.06(b)(2) to read as follows.

- “(2) Beam Ties. The top flange of exterior steel beams or girders supporting the cantilever forming brackets shall be tied to the bottom flange of the next interior beam. The top flange of exterior concrete beams supporting the cantilever forming brackets shall be tied to the top flange of the next interior beam. The ties shall be spaced at 4 ft (1.2 m) centers. Permanent cross frames on steel girders may be considered a tie. Ties shall be a minimum of 1/2 inch (13 mm) diameter threaded rod with an adjusting mechanism for drawing the tie taut. The ties shall utilize hanger brackets or clips which hook onto the flange of steel beams. No welding will be permitted to the structural steel or stud shear connectors, or to reinforcement bars of concrete beams, for the installation of the tie bar system. After installation of the ties and blocking, the tie shall be drawn taut until the tie does not vary from a straight line from beam to beam. The tie system shall be approved by the Engineer.”

Revise Article 503.06(b)(3) to read as follows.

- “(3) Beam Blocks. Suitable beam blocks of 4 in x 4 in (100 x 100 mm) timbers or metal structural shapes of equivalent strength or better, acceptable to the Engineer, shall be wedged between the webs of the two beams tied together, within 6 inches (150 mm) of the bottom flange at each location where they are tied. When it is not feasible to have

the resulting force from the leg brace of the cantilever brackets transmitted to the web within 6 inches (150 mm) of the bottom flange, then additional blocking shall be placed at each bracket to transmit the resulting force to within 6 inches (150 mm) of the bottom flange of the next interior beam or girder.”

Delete the last paragraph of Article 503.06(b).

DRILLED SHAFTS

Effective: October 5, 2015

Revised: October 4, 2016

Revise Section 516 of the Standard Specifications to read:

“SECTION 516. DRILLED SHAFTS

516.01 Description. This work shall consist of constructing drilled shaft foundations.

516.02 Materials. Materials shall be according to the following.

Item	Article/Section
(a) Portland Cement Concrete (Note 1)	1020
(b) Reinforcement Bars.....	1006.10
(c) Grout (Note 2)	1024.01
(d) Permanent Steel Casing	1006.05(d)
(e) Slurry (Note 3)	

Note 1. When the soil contains sulfate contaminates, ASTM C 1580 testing will be performed to assess the severity of sulfate exposure to the concrete. If the sulfate contaminate is >0.10 to < 0.20 percent by mass, a Type II (MH) cement shall be used. If the sulfate contaminate is >0.20 to < 2.0 percent by mass, a Type V cement shall be used. If the sulfate contaminate is ≥ 2.0 percent by mass, refer to ACI 201.2R for guidance.

Note 2. The sand-cement grout mix shall be according to Section 1020 and shall be two to five parts sand and one part Type I or II cement. The maximum water cement ratio shall be sufficient to provide a flowable mixture with a typical slump of 10 in. (250 mm).

Note 3. Slurry shall be bentonite, emulsified polymer, or dry polymer, and shall be approved by the Engineer.

516.03 Equipment. Equipment shall be according to the following.

Item	Article/Section
(a) Concrete Equipment	1020.03
(b) Drilling Equipment (Note 1)	
(c) Hand Vibrator	1103.17(a)
(d) Underwater Concrete Placement Equipment	1103.18

Note 1. The drilling equipment shall have adequate capacity, including power, torque and down thrust, to create a shaft excavation of the maximum diameter specified to a depth of 20 percent beyond the depths shown on the plans.

516.04 Submittals. The following information shall be submitted on form BBS 133.

(a) Qualifications. At the time of the preconstruction conference, the Contractor shall provide the following documentation.

(1) References. A list containing at least three projects completed within the three years prior to this project's bid date which the Contractor performing this work has installed drilled shafts of similar diameter, length, and site conditions to those shown in the plans. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractor's participation on those projects.

(2) Experience. Name and experience record of the drilled shaft supervisor, responsible for all facets of the shaft installation, and the drill operator(s) who will be assigned to this project. The supervisor and operator(s) shall each have a minimum of three years experience in the construction of drilled shafts.

(b) Installation Procedure. A detailed installation procedure shall be submitted to the Engineer for acceptance at least 28 days prior to drilled shaft construction and shall address each of the following items unless otherwise directed by the Engineer in writing.

(1) Equipment List. List of proposed equipment to be used including cranes, drill rigs, augers, boring tools, casing, vibratory hammers, core barrels, bailing buckets, final cleaning equipment, slurry equipment, tremies, or concrete pumps, etc.

(2) General Sequence. Details of the overall construction operation sequence, equipment access, and the sequence of individual shaft construction within each substructure bent or footing group. The submittal shall address the Contractor's proposed time delay and/or the minimum concrete strength necessary before initiating a shaft excavation adjacent to a recently installed drilled shaft.

(3) Shaft Excavation. A site specific step by step description of how the Contractor anticipates the shaft excavation to be advanced based on their evaluation of the subsurface data and conditions expected to be encountered. This sequence shall note the method of casing advancement, anticipated casing lengths, tip elevations and diameters, the excavation tools used and drilled diameters created. The Contractor shall indicate whether wet or dry drilling conditions are expected and if groundwater will be sealed from the excavation.

- (4) Slurry. When the use of slurry is proposed, details on the types of additives to be used and their manufacturers shall be provided. In addition, details covering the measurement and control of the hardness of the mixing water, agitation, circulation, de-sanding, sampling, testing, and chemical properties of the slurry shall be submitted.
- (5) Shaft Cleaning. Method(s) and sequence proposed for the shaft cleaning operation.
- (6) Reinforcement Cage and Permanent Casing. Details of reinforcement placement including rolling spacers to be used and method to maintain proper elevation and location of the reinforcement cage within the shaft excavation during concrete placement. The method(s) of adjusting the reinforcement cage length and permanent casing if rock is encountered at an elevation other than as shown on the plans. As an option, the Contractor may perform soil borings and rock cores at the drilled shaft locations to determine the required reinforcement cage and permanent casing lengths.
- (7) Concrete Placement. Details of concrete placement including proposed operational procedures for free fall, tremie or pumping methods. The sequence and method of casing removal shall also be stated along with the top of pour elevation, and method of forming through water above streambed.
- (8) Mix Design. The proposed concrete mix design(s).
- (9) Disposal Plan. Containment and disposal plan for slurry and displaced water. Containment and disposal plan for contaminated concrete pushed out of the top of the shaft by uncontaminated concrete during concrete placement.
- (10) Access and Site Protection Plan. Details of access to the drilled shafts and safety measures proposed. This shall include a list of casing, scaffolding, work platforms, temporary walkways, railings, and other items needed to provide safe access to the drilled shafts. Provisions to protect open excavations during non-working hours shall be included.

The Engineer will evaluate the drilled shaft installation procedure and notify the Contractor of acceptance, need for additional information, or concerns with the installation's effect on the existing or proposed structure(s).

CONSTRUCTION REQUIREMENTS

516.05 General. Excavation for drilled shaft(s) shall not proceed until written authorization is received from the Engineer. The Contractor shall be responsible for verification of the dimensions and alignment of each shaft excavation as directed by the Engineer.

Unless otherwise approved in the Contractor's installation procedure, no shaft excavation, casing installation, or casing removal with a vibratory hammer shall be made within four shaft diameters center to center of a shaft with concrete that has a compressive strength less than 1500 psi (10,300 kPa). The site-specific soil strengths and installation methods selected will determine the actual required minimum spacing, if any, to address vibration and blow out concerns.

Lost tools shall not remain in the shaft excavation without the approval of the Engineer.

Blasting shall not be used as a method of shaft excavation.

516.06 Shaft Excavation Protection Methods. The construction of drilled shafts may involve the use of one or more of the following methods to support the excavation during the various phases of shaft excavation, cleaning, and concrete placement dependent on the site conditions encountered. Surface water shall not flow uncontrolled into the shaft excavation, however water may be placed into the shaft excavation in order to meet head pressure requirements according to Articles 516.06(c) and 516.13.

The following are general descriptions indicating the conditions when these methods may be used.

- (a) **Dry Method.** The dry construction method shall only be used at sites where the groundwater and soil conditions are suitable to permit the drilling and dewatering of the excavation without causing subsidence of adjacent ground, boiling of the base soils, squeezing, or caving of the shaft side walls. The dry method shall consist of drilling the shaft excavation, removing accumulated water, cleaning the shaft base, and placing the reinforcement cage and concrete in a predominately dry excavation.
- (b) **Slurry Method.** The slurry construction method may be used at sites where dewatering the excavation would cause collapse of the shaft sidewalls or when the volume and head of water flowing into the shaft is likely to contaminate the concrete during placement resulting in a shaft defect. This method uses slurry, or in rare cases water, to maintain stability of the shaft sidewall while advancing the shaft excavation. After the shaft excavation is completed, the slurry level in the shaft shall be kept at an elevation to

maintain stability of the shaft sidewall, maintain stability of the shaft base, and prevent additional groundwater from entering the shaft. The shaft base shall be cleaned, the reinforcement cage shall be set, and the concrete shall be discharged at the bottom of the shaft excavation, displacing the slurry upwards.

- (c) Temporary Casing Method. Temporary casing shall be used when either the dry or slurry methods provide inadequate support to prevent sidewall caving or excessive deformation of the shaft excavation. Temporary casing may be used with slurry or be used to reduce the flow of water into the excavation to allow dewatering and concrete placement in a dry shaft excavation. Temporary casing shall not be allowed to remain permanently without the approval of the Engineer.

During removal of the temporary casing, the level of concrete in the casing shall be maintained at a level such that the head pressure inside the casing is a minimum of 1.25 times the head pressure outside the casing, but in no case is less than 5 ft (1.5 m) above the bottom of the casing. Casing removal shall be at a slow, uniform rate with the pull in line with the shaft axis. Excessive rotation of the casing shall be avoided to limit deformation of the reinforcement cage. In addition, the slump requirements during casing removal shall be according to Article 516.12.

When called for on the plans, the Contractor shall install a permanent casing as specified. Permanent casing may be used as a shaft excavation support method or may be installed after shaft excavation is completed using one of the above methods. After construction, if voids are present between the permanent casing and the drilled excavation, the voids shall be filled with grout. Permanent casing shall not remain in place beyond the limits shown on the plans without the specific approval of the Engineer.

When the shaft extends above the streambed through a body of water and permanent casing is not shown, the portion above the streambed shall be formed with removable casings, column forms, or other forming systems as approved by the Engineer. The forming system shall not scar or spall the finished concrete or leave in place any forms or casing within the removable form limits as shown on the plans unless approved as part of the installation procedure. The forming system shall not be removed until the concrete has attained a minimum compressive strength of 2500 psi (17,200 kPa) and cured for a minimum of 72 hours. For shafts extending through water, the concrete shall be protected from water action after placement for a minimum of seven days.

516.07 Slurry. When slurry is used, the Contractor shall provide a technical representative of the slurry additive manufacturer at the site prior to introduction of the slurry into the first shaft where slurry will be used, and during drilling and completion of a minimum of one shaft to adjust the slurry mix to the specific site conditions. During construction, the level of the slurry shall be maintained a minimum of 5 feet (1.5 m) above the height required to prevent

caving of the shaft excavation. In the event of a sudden or significant loss of slurry in the shaft excavation, the construction of that foundation shall be stopped and the shaft excavation backfilled or supported by temporary casing, until a method to stop slurry loss, or an alternate construction procedure, has been approved by the Engineer.

- (a) General Properties. The material used to make the slurry shall not be detrimental to the concrete or surrounding ground. Mineral slurries shall have both a mineral grain size that remains in suspension and sufficient viscosity and gel characteristics to transport excavated material to a suitable screening system. Polymer slurries shall have sufficient viscosity and gel characteristics to transport excavated material to suitable screening systems or settling tanks. The percentage and specific gravity of the material used to make the slurry shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement.

If approved by the Engineer, the Contractor may use water and excavated soils as drilling slurry. In this case, the range of acceptable values for density, viscosity and pH, as shown in the following table for bentonite slurry shall be met.

When water is used as the slurry to construct rock sockets in limestone, dolomite, sandstone or other formations that are not erodible, the requirements for slurry testing shall not apply if the entire fluid column is replaced with fresh water after drilling. To do so, fresh water shall be introduced at the top of the shaft excavation and existing water used during drilling shall be pumped out of the shaft excavation from the bottom of the shaft excavation until the entire volume of fluid has been replaced.

- (b) Preparation. Prior to introduction into the shaft excavation, the manufactured slurry admixture shall be pre-mixed thoroughly with clean, fresh water and for adequate time in accordance with the slurry admixture manufacturer's recommendations. Slurry tanks of adequate capacity shall be used for slurry mixing, circulation, storage and treatment. No excavated slurry pits will be allowed in lieu of slurry tanks without approval from the Engineer. Adequate desanding equipment shall be provided to control slurry properties during the drilled shaft excavation in accordance with the values provided in Table 1.
- (c) Quality Control. Quality control tests shall be performed on the slurry to determine density, viscosity, sand content and pH of freshly mixed slurry, recycled slurry and slurry in the shaft excavation. Tests of slurry samples from within two feet of the bottom and at mid-height of the shaft excavation shall be conducted in each shaft excavation during the excavation process to measure the consistency of the slurry. A minimum of four sets of tests shall be conducted during the first eight hours of slurry use on the project. When a series of four test results do not change more than 1% from the initial test, the testing frequency may be decreased to one set every four hours of slurry use. Reports of all tests, signed by an authorized representative of the Contractor, shall be furnished to the

Engineer upon completion of each drilled shaft. The physical properties of the slurry shall be as shown in Table 1.

The slurry shall be sampled and tested less than 1 hour before concrete placement. Any heavily contaminated slurry that has accumulated at the bottom of the shaft shall be removed. The contractor shall perform final shaft bottom cleaning after suspended solids have settled from the slurry. Concrete shall not be placed if the slurry does not have the required physical properties.

Table 1 – SLURRY PROPERTIES				
	Bentonite	Emulsified Polymer	Dry Polymer	Test Method
Density, lb/cu ft (kg/cu m) (at introduction)	65.2 ± 1.6 ¹ (1043.5 ± 25.6)	63 (1009.0) max.	63 (1009.0) max.	ASTM D 4380
Density, lb/cu ft (kg/cu m) (prior to concrete placement)	67.0 ± 3.5 ¹ (1073.0 ± 56.0)	63 (1009.0) max.	63 (1009.0) max.	ASTM D 4380
Viscosity ² , sec/qt (sec/L)	46 ± 14 (48 ± 14)	38 ± 5 (40 ± 5)	65 ± 15 (69 ± 16)	ASTM D 6910
pH	9.0 ± 1.0	9.5 ± 1.5	9.0 ± 2.0	ASTM D 4972
Sand Content, percent by volume (at introduction)	4 max.	1 max.	1 max.	ASTM D 4381
Sand Content, percent by volume (prior to concrete placement)	10 max.	1 max.	1 max.	ASTM D 4381
Contact Time ³ , hours	4 max.	72 max.	72 max.	

Note 1. When the slurry consists of only water and excavated soils, the density shall not exceed 70 lb/cu ft (1121 kg/cu m).

Note 2. Higher viscosities may be required in loose or gravelly sand deposits.

Note 3. Contact time is the time without agitation and sidewall cleaning.

516.08 Obstructions. An obstruction is an unknown isolated object that causes the shaft excavation method to experience a significant decrease in the actual production rate and requires the Contractor to core, break up, push aside, or use other means to mitigate the obstruction. Subsurface conditions such as boulders, cobbles, or logs and buried infrastructure such as footings, piling, or abandoned utilities, when shown on the plans, shall not constitute an obstruction. When an obstruction is encountered, the Contractor shall notify the Engineer immediately and upon concurrence of the Engineer, the Contractor shall mitigate the obstruction with an approved method.

516.09 Top of Rock. The top of rock will be considered as the point where rock, defined as bedded deposits and conglomerate deposits exhibiting the physical characteristics and difficulty of rock removal as determined by the Engineer, is encountered which cannot be drilled with augers and/or underreaming tools configured to be effective in the soils indicated in the contract documents.

516.10 Design Modifications. If the top of rock elevation differs from that shown on the plans by more than 10 percent of the length of the drilled shaft above the rock, the Engineer shall be contacted to determine if any drilled shaft design changes may be required. In addition, if the type of soil or rock encountered is not similar to that shown in the subsurface exploration data, the Contractor may be required to extend the drilled shaft length(s) beyond those specified in the plans. In either case, the Engineer will determine if revisions are necessary and the extent of the modifications required.

516.11 Excavation Cleaning and Inspection. Materials removed or generated from the shaft excavations shall be disposed of according to Article 202.03.

After excavation, each shaft shall be cleaned. For a drilled shaft terminating in soil, the depth of sediment or debris shall be a maximum of 1 1/2 in. (38 mm). For a drilled shaft terminating in rock, the depth of sediment or debris shall be a maximum of 1/2 in. (13 mm).

A shaft excavation shall be overreamed when, in the opinion of the Engineer, the sidewall has softened, swelled, or has a buildup of slurry cake. Overreaming may also be required to correct a shaft excavation which has been drilled out of tolerance. Overreaming may be accomplished with a grooving tool, overreaming bucket, or other approved equipment. Overreaming thickness shall be a minimum of 1/2 in. (13 mm) and a maximum of 3 in. (75 mm).

516.12 Reinforcement. This work shall be according to Section 508 and the following.

The shaft excavation shall be cleaned and inspected prior to placing the reinforcement cage. The reinforcement cage shall be completely assembled prior to drilling and be ready for adjustment in length as required by the conditions encountered. The reinforcement cage shall be lifted using multiple point sling straps or other approved methods to avoid reinforcement

cage distortion or stress. Cross frame stiffeners may be required for lifting or to keep the reinforcement cage in proper position during lifting and concrete placement.

The Contractor shall attach rolling spacers to keep the reinforcement cage centered within the shaft excavation during concrete placement and to ensure that at no point will the finished shaft have less than the minimum concrete cover(s) shown on the plans. The rolling spacers or other approved non-corrosive spacing devices shall be installed within 2 ft (0.6 m) of both the top and bottom of the drilled shaft and at intervals not exceeding 10 ft (3 m) throughout the length of the shaft to ensure proper reinforcement cage alignment and clearance for the entire shaft. The number of rolling spacers at each level shall be one for each 1.0 ft (300 mm) of shaft diameter, with a minimum of four rolling spacers at each level. For shafts with different shaft diameters throughout the length of the excavation, different sized rolling spacers shall be provided to ensure the reinforcement cage is properly positioned throughout the entire length of the shaft.

When a specific concrete cover between the base of the drilled shaft and the reinforcement cage is shown on the plans, the bottom of the reinforcement cage shall be supported so that the proper concrete cover is maintained.

If the conditions differ such that the length of the shaft is increased, additional longitudinal bars shall be either mechanically spliced or lap spliced to the lower end of the reinforcement cage and confined with either hoop ties or spirals. The Contractor shall have additional reinforcement available or fabricate the reinforcement cages with additional length as necessary to make the required adjustments in a timely manner as dictated by the encountered conditions. The additional reinforcement may be non-epoxy coated.

516.13 Concrete Placement. Concrete work shall be performed according to the following.

Throughout concrete placement the head pressure inside the drilled shaft shall be at least 1.1 times the head pressure outside the drilled shaft.

Concrete placement shall begin within 1 hour of shaft cleaning and inspection. The pour shall be made in a continuous manner from the bottom to the top elevation of the shaft as shown on the contract plan or as approved in the Contractor's installation procedure. Concrete placement shall continue after the shaft excavation is full and until 18 in. (450 mm) of good quality, uncontaminated concrete is expelled at the top of shaft. Vibration of the concrete will not be allowed when the concrete is displacing slurry or water. In dry excavations, the concrete in the top 10 ft (3 m) of the shaft shall be vibrated.

When using temporary casing or placing concrete under water or slurry, a minimum of seven days prior to concrete placement, a 4 cu yd (3 cu m) trial batch of the concrete mixture shall be

performed to evaluate slump retention. Temporary casing shall be withdrawn before the slump of the concrete drops below 6 in. (150 mm). For concrete placed using the slurry method of construction, the slump of all concrete placed shall be a minimum of 6 in. (150 mm) at the end of concrete placement.

Devices used to place concrete shall have no aluminum parts in contact with concrete.

When the top of the shaft is at the finished elevation and no further concrete placement above the finished elevation is specified, the top of the shaft shall be level and finished according to Article 503.15(a).

Concrete shall be placed by free fall, tremie, or concrete pump subject to the following conditions.

- (a) Free Fall Placement. Concrete shall only be placed by free fall when the rate of water infiltration into the shaft excavation is less than 12 in. (300 mm) per hour and the depth of water in the shaft excavation is less than 3 in. (75 mm) at the time of concrete placement.

Concrete placed by free fall shall fall directly to the base without contacting the reinforcement cage, cross frame stiffeners, or shaft sidewall. Drop chutes may be used to direct concrete to the base during free fall placement.

Drop chutes used to direct placement of free fall concrete shall consist of a smooth tube. Concrete may be placed through either a hopper at the top of the tube or side openings as the drop chute is retrieved during concrete placement. The drop chute shall be supported so that free fall does not exceed 60 ft (18.3 m) for conventional concrete or 30 ft (9.1 m) for self-consolidating concrete. If placement cannot be satisfactorily accomplished by free fall in the opinion of the Engineer, either a tremie or pump shall be used to accomplish the pour.

- (b) Tremie and Concrete Pump Placement. Concrete placement shall be according to Article 503.08, except the discharge end of the steel pipe shall remain embedded in the concrete a minimum of 10 ft (3.0 m) throughout concrete placement when displacing slurry or water.

516.14 Construction Tolerances. The following construction tolerances shall apply to all drilled shafts.

- (a) Center of Shaft. The center of the drilled shaft shall be within 3 in. (75 mm) of the plan station and offset at the top of the shaft.

- (b) Center of Reinforcement Cage. The center of the reinforcement cage shall be within 1 1/2 in. (40 mm) of plan station and offset at the top of the shaft.
- (c) Vertical Plumbness of Shaft. The out of vertical plumbness of the shaft shall not exceed 1.5 percent.
- (d) Vertical Plumbness of Reinforcement Cage. The out of vertical plumbness of the shaft reinforcement cage shall not exceed 0.83 percent.
- (e) Top of Shaft. The top of the shaft shall be no more than 1 in. (25 mm) above and no more than 3 in. (75 mm) below the plan elevation.
- (f) Top of Reinforcement Cage. The top of the reinforcement cage shall be no more than 1 in. (25 mm) above and no more than 3 in. (75 mm) below the plan elevation.
- (g) Bottom of shaft. Excavation equipment and methods used to complete the shaft excavation shall have a nearly planar bottom. The cutting edges of excavation equipment used to create the bottom of shafts in rock shall be normal to the vertical axis of the shaft within a tolerance of 6.25 percent.

516.15 Method of Measurement. This work will be measured for payment in place and the volume computed in cubic yards (cubic meters). The volume will be computed using the plan diameter of the shaft multiplied by the measured length of the shaft. The length of shaft in soil will be computed as the difference in elevation between the top of the drilled shaft shown on the plans, or as installed as part of the Contractor's installation procedure, and the bottom of the shaft or the top of rock (when present) whichever is higher. The length of shaft in rock will be computed as the difference in elevation between the measured top of rock and the bottom of the shaft.

When permanent casing is specified, it will be measured for payment in place, in feet (meters). Permanent casing installed at the Contractor's option will not be measured for payment.

Reinforcement furnished and installed will be measured for payment according to Article 508.07.

516.16 Basis of Payment. This work will be paid for at the contract unit price per cubic yard (cubic meter) for DRILLED SHAFT IN SOIL, and/or DRILLED SHAFT IN ROCK.

Permanent casing will be paid for at the contract unit price per foot (meter) for PERMANENT CASING.

Reinforcement furnished and installed will be paid for according to Article 508.08.

Obstruction mitigation will be paid for according to Article 109.04.”

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CROSSHOLE SONIC LOGGING TESTING OF DRILLED SHAFTS

Effective: April 20, 2016

Revised: August 9, 2019

Description. This work shall consist of furnishing and installing materials and equipment necessary to install access ducts in all drilled shafts of structures identified on the plans, and to perform Crosshole Sonic Logging (CSL) testing of selected drilled shafts on these structures. This work shall be according to Illinois Modified ASTM D6760. This work also includes analysis of the CSL data, preparation of reports summarizing the CSL data, and investigating anomalies identified in the CSL data. This work shall also include grouting of all access ducts after testing and approval by the Engineer.

Materials. Materials shall be according to the following.

- (a) Nonshrink Grout (Note 1).....1024.02
Note 1. Grout shall attain a minimum strength equal to the required strength of the drilled shaft concrete at 14 days.

Qualifications. A consulting firm experienced in CSL testing shall conduct this work. The CSL consulting firm shall be a company independent from the Contractor with a minimum of 3 years of experience in performing CSL testing of drilled shafts. The individual employee of the CSL consulting firm performing analysis of the CSL data and preparing the report shall be an Illinois Licensed Professional Engineer and have experience on a minimum of 5 projects performing CSL testing of drilled shafts.

The name, contact information, and qualifications of the CSL consulting firm, including the names and experience of the individual employees performing and analyzing the test results and preparing the report, shall be submitted to the Engineer at least 30 days prior to drilled shaft construction.

Construction. Access ducts shall be placed in all drilled shafts for the structures indicated on the plans, attached to the reinforcement cage and situated symmetrically around the diameter of the shaft according to the Illinois Modified ASTM D6760. The Engineer will determine which drilled shafts shall have CSL testing performed after the concrete has been placed in the drilled shafts, and may direct additional tests, if necessary, due to problems encountered or observed during drilled shaft construction.

After permission is given by the Engineer, the access ducts shall be grouted. The grout shall be placed with a pump, starting at the bottom of each access duct.

Superimposed loads, either dead or live, shall not be applied to a drilled shaft until CSL testing is completed, CSL reports have been submitted, any necessary repairs have been completed, access ducts have been grouted, and permission has been granted by the Engineer.

Reports. Reports shall be according to Illinois Modified ASTM D6760. Each anomalous zone detected by the CSL testing shall be identified and discussed in the report. An anomalous zone shall be defined as areas where velocity reduction exceeds 20 percent of the average velocity of properly placed and cured shaft concrete at the time of testing.

Anomalies. If anomalies are identified, they shall be investigated by coring or other methods approved by the Engineer.

Correction of Drilled Shaft Defects. When testing determines that a defect is present, the Engineer will direct the Contractor to submit remedial measures for approval. No compensation will be made for remedial work, or losses, or damage, due to remedial work of drilled shafts found defective or not in accordance with the drilled shaft specifications or plans. Modifications to the drilled shaft design, or any load transfer mechanisms required by the remedial action, must be designed, detailed, and sealed by an Illinois Licensed Structural Engineer, and submitted for approval.

Method of Measurement. Installation and grouting of access ducts will be measured for payment per shaft by the linear foot of drilled shaft(s) with access ducts.

CSL testing, analysis, and reporting will be measured for payment by each drilled shaft foundation tested.

Investigation of anomalies will not be measured for payment.

Basis of Payment. Installation and grouting of access ducts will be paid for at the contract unit price per foot for CROSSHOLE SONIC LOGGING ACCESS DUCTS. CSL testing, analysis, and reporting will be paid for at the contract unit price per each for CROSSHOLE SONIC LOGGING TESTING.

ILLINOIS MODIFIED ASTM D6760

Effective Date: August 9, 2019

Standard Test Method for

Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing

Reference ASTM D6760-14

ASTM SECTION	Illinois Modification										
3.1.1	Revise this section as follows: <i>access ducts, n</i> – preformed steel tubes or drilled boreholes, placed in the concrete to allow probe entry in pairs to measure pulse transmission in the concrete between the probes.										
6.1	Revise the second sentence of this section as follows: The tubes shall be mild steel. Delete the third, fourth, and fifth sentences of this section.										
7.1.1	<p>Revise this section as follows: The access ducts shall be installed during construction of the drilled shaft.</p> <p>For drilled shafts foundations, access ducts shall be provided according to the following table.</p> <table border="1"> <thead> <tr> <th>Reinforcing Cage Diameter (feet)</th> <th>Number of access ducts</th> </tr> </thead> <tbody> <tr> <td>≤ 4.0</td> <td>3</td> </tr> <tr> <td>4.1 to 5.0</td> <td>4</td> </tr> <tr> <td>5.1 to 7.0</td> <td>6</td> </tr> <tr> <td>> 7.0</td> <td>8</td> </tr> </tbody> </table> <p>Access ducts shall be spread equally around the perimeter and spaced at an equal distance from the axis.</p> <p>Delete Fig. 4.</p>	Reinforcing Cage Diameter (feet)	Number of access ducts	≤ 4.0	3	4.1 to 5.0	4	5.1 to 7.0	6	> 7.0	8
Reinforcing Cage Diameter (feet)	Number of access ducts										
≤ 4.0	3										
4.1 to 5.0	4										
5.1 to 7.0	6										
> 7.0	8										
7.1.2	Revise the second sentence of this section as follows: The exterior tube surface shall be free from contamination (for example, oil, dirt, loose rust, mill scale, etc.) to ensure a good bond between the tube surface and the surrounding concrete.										
7.1.3	Delete the third sentence of this section.										

ILLINOIS MODIFIED ASTM D6760

Effective Date: August 9, 2019

Standard Test Method for

Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing

Reference ASTM D6760-14

7.2	<p>Revise the first sentence of this section as follows: The access tubes shall be installed such that their bottom is within 4 inches of the bottom of the concrete deep foundation element so that the bottom condition can be tested.</p> <p>Revise the sixth sentence of this section as follows: Access tubes shall be filled with water prior to concrete placement to assure good bonding of the concrete to the tube after the concrete cools. The access tubes shall be kept full of water until the tubes are grouted.</p>
7.3	<p>Revise the first sentence of this section as follows: In cases where drilled shafts to be tested have access ducts that do not permit passage of the probes, do not retain water, are not plumb, are debonded from the concrete, or cannot be used for testing for other reasons, drilled boreholes shall be used to provide probe access.</p>
7.4.2	<p>Revise the second sentence of this section as follows: The tests shall be performed no later than 21 days after concrete casting.</p>
7.6	<p>Delete this section.</p>
7.8.1	<p>Revise the first sentence of this section as follows: If the ultrasonic profile indicates an anomaly, then the suspect anomaly zone shall be further investigated by special test procedures such as fan shaped tests, tests with the probes raised at a fixed offset distance, or other tomographical techniques (1, 2).</p>
7.8.2	<p>Delete Note 5 of this section.</p>

ERECTION OF BRIDGE GIRDERS OVER OR ADJACENT TO RAILROADS

Effective: August 9, 2019

Description: In addition to the requirements of Article 504.06(d) and 505.08(e), the following shall apply.

The Contractor or sub-Contractor performing the erection of steel or concrete beams or girders over, or adjacent to (within 25 ft. of), active railroad tracks shall submit an erection plan to the Engineer for approval prior to starting the work.

Erection Plan: The Erection Contractor shall retain the services of an Illinois Licensed Structural Engineer for the completion of a project-specific erection plan. The structural engineer, herein referred to as the Erection Engineer, shall sign and seal the erection plan, drawings, and calculations for the proposed erection of the structural beams or girders.

The erection plan shall be complete in detail for all phases, stages, and conditions anticipated during erection. The erection plan shall include structural calculations and supporting documentation necessary to completely describe and document the means, methods, temporary support positions, and loads necessary to safely erect the structural members in conformance with the contract documents and as outlined herein. The erection plans shall address and account for all items pertinent to the erection including such items as sequencing, falsework, temporary shoring and/or bracing, girder stability, crane positioning and movement, means of access, pick points, girder shape, permissible deformations and roll, interim/final plumbness, cross frame/diaphragm placement and connections, bolting and anchor bolt installation sequences and procedures, and blocking and anchoring of bearings. The Erection Contractor shall be responsible for the stability of the partially erected structure during all phases of erection.

The erection plans and procedures shall be submitted to the Engineer for review and acceptance prior to starting the work. Review, acceptance and/or comments by the Department shall not be construed to guarantee the safety or final acceptability of the work or compliance with all applicable specifications, codes, or contract requirements, and shall neither relieve the Contractor of the responsibility and liability to comply with these requirements, nor create liability for the Department. Significant changes to the erection plan in the field must be approved by the Erection Engineer and accepted by the Engineer for the Department.

Basis of Payment: This work shall not be paid for separately but shall be included in the applicable pay items according to Article 504.08 or 505.13 of the Standard Specifications.

REVISIONS TO THE ILLINOIS PREVAILING WAGE RATES

The Prevailing rates of wages are included in the Contract proposals which are subject to Check Sheet #5 of the Supplemental Specifications and Recurring Special Provisions. The rates have been ascertained and certified by the Illinois Department of Labor for the locality in which the work is to be performed and for each craft or type of work or mechanic needed to execute the work of the Contract. As required by Prevailing Wage Act (820 ILCS 130/0.01, et seq.) and Check Sheet #5 of the Contract, not less than the rates of wages ascertained by the Illinois Department of Labor and as revised during the performance of a Contract shall be paid to all laborers, workers and mechanics performing work under the Contract. Post the scale of wages in a prominent and easily accessible place at the site of work.

If the Illinois Department of Labor revises the prevailing rates of wages to be paid as listed in the specification of rates, the contractor shall post the revised rates of wages and shall pay not less than the revised rates of wages. Current wage rate information shall be obtained by visiting the Illinois Department of Labor web site at <http://www.state.il.us/agency/idol/> or by calling 312-793-2814. It is the responsibility of the contractor to review the rates applicable to the work of the contract at regular intervals in order to insure the timely payment of current rates. Provision of this information to the contractor by means of the Illinois Department of Labor web site satisfies the notification of revisions by the Department to the contractor pursuant to the Act, and the contractor agrees that no additional notice is required. The contractor shall notify each of its subcontractors of the revised rates of wages.